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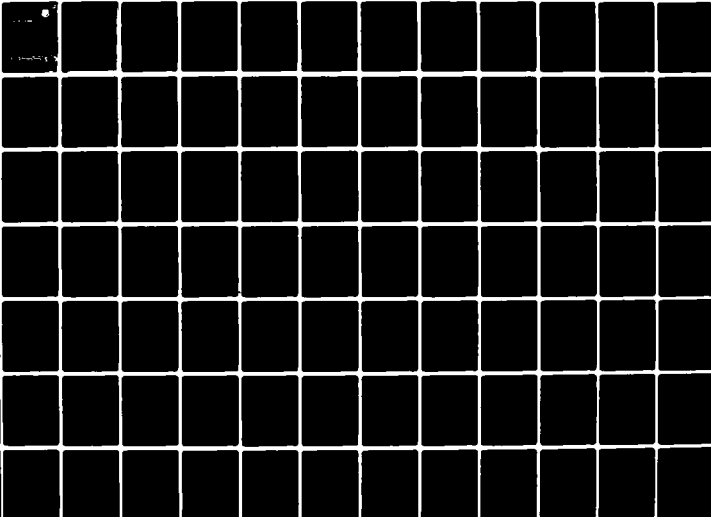
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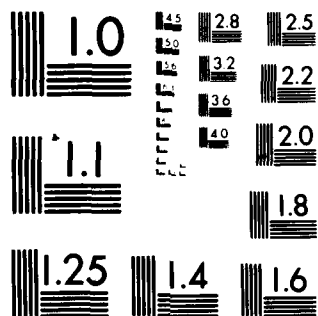
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REPORT-TRAC-64, Vol II (44-104)
Final Technical Report
April 1964

LEAST COST TEST PROFILE

MIT Research Institute

Joseph J. Steinhilber

APPROVED FOR PUBLIC RELEASE INFORMATION REPORTS

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ARMED AIR DEVELOPMENT CENTER
ATTENTION: DIRECTOR
CROFTON AVIATION BLDG, NY 10411

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This report was prepared by the RAND Corp. under contract to the Department of Defense. It is not to be distributed to the general public, including foreign officials.

Because of the size of this report, it has been divided into two volumes. Volume I contains the Basic Report and Appendix A. Volume II contains Appendixes B and C.

DDAO-12-42-44, Vol II (of two) has been reviewed and is approved for publication.

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TABLE OF CONTENTS

Appendix B - Test Cost Estimates.	B-1
Appendix C - User Questionnaire Summary Forms	C-1
Appendix D - User Questionnaire Comments.	D-1
Appendix E - Terminal Point Questionnaire Forms	E-1
Appendix F - Sample Survey Questionnaire Forms.	F-1
Appendix G - General shelter Data/Information Summaries	G-1
Appendix H - Test Adequacy and Sequencing	H-1

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Appendix B
TEST COST ESTIMATES

TEST COST ESTIMATES
RESPONDENT 1

<u>TEST</u>	<u>TEST PARAGRAPH</u>	<u>COST (\$)</u>	<u>COMMENTS</u>
PANEL WATERTIGHTNESS	4.4.4.1/4.61	200	
INSERT PROOF LOAD	4.4.4.3/4.6.2	460	
CYLINDER IMPACT	4.6.8	2,400	
MOISTURE RESISTANCE	4.6.6	8,000-	
		12,000	
THERMAL SHOCK	4.6.7	3,200	
MARINE ATMOSPHERE	4.6.9	1,600-	
		2,000	
STRUCTURAL SOUNDNESS	4.6.5	SMALL	
<u>CONTAINERS MODE TESTS</u>			
TOWING	4.7.1	400	
DROPPING	4.7.2	600-1,000	
GROUND TRANSPORTATION	4.7.3	-	UNIFORM FLOOR LOADING WITH NO INSTRUMENTATION USE ARMY OR HUGES COST DATA PLUS TRANSPORTATION COSTS.
RAILWAY HUMMING	4.7.4	-	" "
LIFTING	4.7.5	11,000 PLUS 7,000 TRANSPORTATION	TESTS CONDUCTED BY TEST LAB.
SIX-HIGH STACKING	4.7.6	-	INCLUDED IN 4.7.5
LONG RESTRAINT	4.7.7	-	" "
RACKING	4.7.8	-	" "
LASHING	4.7.9	-	" "
WATER LEAKAGE	4.7.10	200	
INTERNAL AIR LEAKAGE	4.7.11	300	
TEMPERATURE	4.7.12	5,000 PLUS	
HIGH TEMPERATURE		2,000 TRANSPORTATION	
<u>SHELTER MODE TESTS</u>			
ELECTRICAL	4.8.1	SMALL	P/O FINAL INSPECTION
ROOF LOAD	4.8.2	800	
FLOOR LOAD	4.8.3	900	
STATIC DOOR LOAD	4.8.4	600	
WATER LEAKAGE	4.8.5	400	
HEAT TRANSFER	4.8.6	8,400	
SOLAR LOAD	4.8.10	1,200	
ERECTION AND STRIKE	4.8.9		
A.		1,600	THREE TIMES
B.		600	ONE TIME ON 24" DIAGONAL.

TEST COST ESTIMATES

RESPONDENT 1

<u>TEST</u>	<u>TEST PARAGRAPH</u>	<u>COST (\$)</u>	<u>COMMENTS</u>
BLACKOUT	4.8.8	240	
STEP	4.8.10	200	
POST TEST INSPECTION	4.9	200	
FINISH AND OPERABILITY INSPECTION	-	200	
FORKLIFT HANDLING	-	2,000	

TEST COST ESTIMATES

RESPONDENT 2

COSTS

<u>TEST</u>	<u>TEST PARAGRAPH</u>	<u>FACILITY COST</u> (\$)	<u>SHOP HOURS</u>	<u>ENGINEER HOURS**</u>	<u>MATERIAL ESTIMATE</u>	<u>COMMENTS</u>
<u>GROUP A</u>						
CONSTRUCTION	4.6.10	* 4,000	1	16	0	
TIGHTNESS						
VISUAL AND	4.6.14	0	1/SHELTER	16	0	
MECHANICAL						
<u>GROUP B</u>						
DIMENSIONAL	4.6.13	0	1/SHELTER	16	0	
SHELTER WEIGHT	4.6.15	* 2,000	.5	16	0	
DOOR LATCH	4.6.16	50	.5	16	0	
TORQUE						
EYE PULLS	4.6.25.1	* 4,000	8	24	2,000	
AIR TRANSPORT,	4.6.26	0	16	24	500	
SIMULATED						
STATIC DOOR	4.6.27	200	1	16	0	
LOAD						
LIGHT TIGHTNESS	4.6.29	0	.5	16	0	
WATER TIGHTNESS	4.6.31	* 5,000	2	16	0	
FORDING	4.6.32	* 2,500	3	19	0	
ROOF ACCESS STEPS	4.6.28	200	1	16	0	
<u>GROUP C</u>						
DROPS	4.6.23	0	16	24	0	DOES NOT IN- CLUDE COST OF DUMMY LOADS.
<u>EMI</u>						
SUPPRESSION	4.6.30	0	0	8	800	
HOLD DOWN	4.6.33	* 4,000	3	16	1,500	CONSULTANT COST USES SAME
ASSEMBLY						FACILITY AS
CORE MATERIAL						4.6.25.1
FLAMMABILITY	4.6.1.4	* 3,000	2	24	0	
WATER ABSORPTION	4.6.15	* 3,000	2	24	0	
ADHESIVE						
HUMIDITY EXPOSURE	4.6.2	* 8,000	24	24	0	BASED ON 50
SALT SPRAY	4.6.2	* 8,000	24	24	0	COUPONS
EXPOSURE						" "
SEALER						
HUMIDITY EXPOSURE	4.6.2	* 8,000	24	24	0	BASED ON 50 COUPONS

TEST COST ESTIMATES

RESPONDENT 2

<u>TEST</u>	<u>TEST PARAGRAPH</u>	<u>FACILITY COST</u> (\$)	<u>SHOP HOURS</u>	<u>ENGINEER HOURS**</u>	<u>MATERIAL ESTIMATE</u>	<u>COMMENTS</u>
SALT SPRAY EXPOSURE	4.6.2	* 8,000	2	24	0	BASED ON 50 COUPONS
SHOCK MOUNTS	4.6.3.1	0	0	0	2,000	SUBCONTRACTED
COMPLETE IMPACT PANEL	4.6.7	* 1,000	16	16	200	
MOISTURE RESISTANCE	4.6.17	* 4,000	0	16	0	4,000 TO RENT FACILITY
TEMPERATURE DIFFERENTIAL	4.6.18	6,000	0	16	0	6,000 TO RENT FACILITY
THERMAL DIFFERENTIAL	4.6.19	3,000	0	16	0	3,000 TO RENT FACILITY
VEHICULAR TRANSPORT	4.6.21	1,000	48	24	1,000	1,000 TO RENT FACILITY
RAIL TRANSPORT	4.6.22	4,000	48	16	1,000	4,000 TO RENT FACILITY
TOWING, SIMULATED	4.6.24	* 4,000	8	16	0	SAME FACILITY AS 4.6.25.1

* Indicates that cost is a one time facility cost that should be depreciated

** Estimate includes 16 hours to write report.

TEST COST ESTIMATES

RESPONDENT 3

<u>TEST</u>	<u>TEST PARAGRAPH</u>	<u>COST</u> (\$)	<u>COMMENTS</u>
MOISTURE RESISTANCE	4.6.17	12,000	
MATERIALS	-	2,000	
TEMPERATURE	4.6.18	4,400	
HEAT TRANSFER		3,800	
DROP	4.6.23	700	
TOWING, SIMULATED	4.6.24	600	
AIR TRANSPORT	4.6.26	600	
SIMULATED LIFTING AND TOWING	4.6.25.1	600	
EYES, SIMULATED			
RAIL TRANSPORT	4.6.22	4,000	
VEHICULAR	4.6.21	5,000	
TRANSPORT			
REPORT	-	1,200	

* TEST PARAGRAPHS were not given. The paragraph numbers given are from MIL-S-55286C (EL) para. 4.4 Table II.

TEST COST ESTIMATES
RESPONDENT 4

<u>TEST</u>	<u>TEST PARAGRAPH*</u>	<u>COST</u> (\$)	<u>COMMENTS</u>
HUMIDITY EXPOSURE/ MOISTURE RESISTANCE	4.6.17		
SMALL CHAMBER		150/DAY	FOR SPECIMEN SAMPLES
LARGE CHAMBER		300/DAY	FOR ENTIRE SHELTER
EXTREME TEMPERATURE	4.6.18		
SMALL CHAMBER		150/DAY	FOR SPECIMEN SAMPLES
LARGE CHAMBER		300/DAY	FOR ENTIRE SHELTER
SALT SPRAY	4.6.2		
SMALL CHAMBER		250/48HRS	FOR SPECIMEN SAMPLES
HEAT TRANSFER	4.6.19.2	1,800	
TEMPERATURE/SOLAR LOAD	4.6.18	1,500 PLUS 300/DAY CHAMBER FEE.	

*TEST Paragraphs were not provided. The paragraph numbers given are from MIL-C-55286 C (EL) para. 4.4 Table II, 4.5.2.3 TABLE VI.

TEST COST ESTIMATES
RESPONDENT 5

<u>TEST</u>	<u>TEST PARAGRAPH</u>	<u>COST</u> (\$)	<u>COMMENTS</u>
MOISTURE RESISTANCE	4.6.17	19,760	COST IS FOR ALL THREE TESTS AND A CERTIFIED REPORT.
TEMPERATURE	4.6.18		
THERMAL DIFFERENTIAL	4.6.19		
TEST REPORT	-		

TEST COST ESTIMATES
RESPONDENT 6

<u>TEST</u>	<u>TEST PARAGRAPH**</u>	<u>COST*</u> (\$)	<u>COMMENTS</u>
DOOR LATCH TORQUE	4.6.16	15	
EYE PULLS	4.6.25.1	300	
AIR TRANSPORT, SIMULATED	4.6.26	150	
STATIC DOOR LOAD	4.6.27	30	
ROOF ACCESS STEPS	4.6.28	30	
LIGHT TIGHTNESS	4.6.29	15	
WATER TIGHTNESS	4.6.31	300	
FORDING	4.6.32	300	
MOISTURE RESISTANCE	4.6.17	2,000	
TEMPERATURE (HIGH, LOW)	4.6.18	7,500	
THERMAL DIFFERENTIAL	4.6.19	3,000	
VEHICULAR TRANSPORT	4.6.21	2,500	
RAIL TRANSPORT	4.6.22	3,000	
DROPS	4.6.23	500	
TOWING, SIMULATED	4.6.24	500	
EMI, RFI	4.6.30	500	
CONSTRUCTION, TIGHTNESS	4.6.10	100	

* Cost, per test item, of conducting individual subtest.

** TEST paragraphs were not provided. The paragraph numbers given are from MIL-C-55286 (EL) para. 4.4 Table II.

TEST COST ESTIMATES
RESPONDENT 7

<u>TEST</u>	<u>TEST PARAGRAPH</u>	<u>FACILITY</u>	<u>COSTS SHOP HOURS</u>	<u>ENGINEER HOURS</u>	<u>COMMENTS</u>
CONSTRUCTION	4.6.10	-	-	8	
TIGHTNESS					
DIMENSIONAL	4.6.13	-	2	-	
DOOR LATCH	4.6.16	-	2	-	
TORQUE					
SHELTER WEIGHT	4.6.15	-	4	4	
THERMAL	4.6.19	-	-	4	PLUS TEST LAB COSTS
DIFFERENTIAL					
MOISTURE	4.6.17	-	-	32	PLUS TEST LAB COSTS
RESISTANCE					
RAIL	4.6.22	-	-	24	PLUS TEST LAB COSTS
TRANSPORT					
DROP	4.6.23	-	6	6	
EYE PULLS	4.6.25.1	-	2		
AIR TRANSPORT,	4.6.26	-	18	6	
SIMULATED					
STATIC DOOR	4.6.27	-	2	-	
LOAD					
ROOF ACCESS	4.6.28	-	2	-	
STEPS					
LIGHT	4.6.29	-	1	-	
TIGHTNESS					
WATER	4.6.31	-	8	4	
TIGHTNESS					
FORDING	4.6.32	-	8	4	

TEST COST ESTIMATES

RESPONDENT 8

<u>TEST</u>	<u>TEST PARAGRAPH</u>	<u>COST*</u> (\$)	<u>COMMENTS</u>
WATERTIGHTNESS	4.6.31	800	
FORDING	4.6.32	800	
DROPS	4.6.23	800	
			PLUS 10,000 FACILITY COST THAT IS DEPRECIATED. SHELTER INCLUDING PAYLOAD.
TOWING, SIMULATED	4.6.24	1,000	
SHELTER WEIGHT	4.6.15	500	
DOOR LATCH TORQUE	4.6.16	100	
VEHICULAR TRANSPORT	4.6.21	7,000	
EYE PULLS	4.6.25.1	100	
AIR TRANSPORT, SIMULATED	4.6.26	1,000	
STATIC DOOR LOAD	4.6.27	100	
ROOF ACCESS STEPS	4.6.28	100	
LIGHT TIGHTNESS	4.6.29	100	
EMI SUPPRESSION	4.6.30	2,500	
HOLD DOWN ASSEMBLY	4.6.33	350	
CONSTRUCTION TIGHTNESS	4.6.10	200	DESTRUCTIVE TEST. TEST PERFORMED ON EVERY SHELTER
DOOR LATCH TORQUE	4.6.16	400	DONE TWICE
IN PROCESS INSPECTION TABLE III	4.6.1	2,000	BASED ON QTY 100
	4.6.2		
	4.6.3.2		
	4.6.4		
	4.6.5		
	4.6.6		
	4.6.8		
	4.6.9		
	4.6.25.2		
	4.6.10.1		
MOISTURE	4.6.17	10,000	FOR S-280
TEMPERATURE	4.6.18	3,000	FOR S-280
THERMAL DIFFERENTIAL	4.6.19	3,000	

*Cost given is per shelter unless otherwise noted.

Appendix C
USER QUESTIONNAIRE
SUMMARY FORMS

QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE

NO.	QUESTION
1	UNIT IDENTIFICATION NUMBER (IDENT NO.)
2	QTY OF EQUIPMENT AT THIS UNIT
3	UNIT TYPE: A = ACTIVE AF, I = AIR NATIONAL GUARD
4	SURVEY TYPE: I = INTERVIEW, Q = MAILED QUESTIONNAIRE
5	NUMBER OF PERSONNEL RESPONDING
6	AVERAGE NUMBER OF YEARS PERSONNEL LOCATED AT THIS UNIT
7	AVERAGE NUMBER OF YEARS EQUIPMENT LOCATED AT THIS UNIT
8	AVERAGE NUMBER OF HELILIFTS (PER YEAR)
9	AVERAGE NUMBER OF RAIL DEPLOYMENTS (PER YEAR)
10	NUMBER OF SHELTERS THAT HAVE BEEN SENT TO DEPOT FOR REPAIR
11	NUMBER OF SHELTERS THAT HAVE BEEN ACCIDENTLY DROPPED
12	NUMBER OF TIMES EQUIPMENT IS SETUP/TORN DOWN AT NIGHT (PER YEAR)
13	NUMBER OF TIMES EQUIPMENT IS SETUP ON JACKS (PER YEAR)
14	NUMBER OF TIMES EQUIPMENT IS SET UP ON UNEVEN TERRAIN (PER YEAR) a) MAXIMUM DIFFERENCE IN ELEVATION SIDE-TO-SIDE (FEET) b) MAXIMUM DIFFERENCE IN ELEVATION FRONT-TO-BACK (FEET)
15	NUMBER OF DAYS EQUIPMENT OPERATED AT HOME STATION (PER YEAR) a) AVERAGE NUMBER OF HOURS OPERATED (PER DAY)
16	NUMBER OF TIMES EQUIPMENT IS SETUP/TORN DOWN AT HOME STATION (PER YEAR)
17	NUMBER OF TIMES EQUIPMENT IS DEPLOYED (PER YEAR) a) MOBILIZING METHOD AND FREQUENCY (PER YEAR): T = TRUCK BED, M = MOBILIZER b) TIE DOWN METHOD: CH = CHAIN, CA = CABLE, W = WEB SLING c) LOADING/UNLOADING METHOD: F = FORKLIFT, 4 = 407L LOADING KIT, W = 5 TON WRECKER, C = CRANE d) AVERAGE NUMBER OF DEPLOYMENTS BY AIR (PER YEAR) IF AIRLIFT WAS INDICATED BUT NOT FREQUENCY INSERT LETTER Z e) AVERAGE DURATION OF DEPLOYMENT (DAYS) f) AVERAGE DISTANCE DEPLOYED ONE WAY OVER PAVED ROADS (MILES) g) AVERAGE DISTANCE DEPLOYED ONE WAY OVER UNPAVED ROADS (MILES) h) NUMBER OF PERSONNEL ON ROOF AT ONE TIME (NORMAL/MAXIMUM) i) AVERAGE NUMBER OF TIMES DOOR OPENED (PER DAY)
18	IS SHELTER FUNCTIONALLY ADEQUATE: Y = YES, N = NO
19	HAVE ANY PROBLEMS BEEN EXPERIENCED IN SHELTER: Y = YES, N = NO
20	ARE THERE ANY AREAS OF CONCERN WITH THE SHELTER: Y = YES, N = NO

UNIT IDENTIFICATIONS

IDENT NO.	UNIT	TYPE	LOCATION
1	5TH TAIRGG	AF	OSAN, KOREA
2	1961 COMM GP	AF	CLARK AB, PHILIPPINES
3	604TH DASS	AF	CAMP RED CLOUD, KOREA
4	239CCF/241ATCF	ANG	BRIDGETON, MO
5	223RD CMBT COMMSQ	ANG	HOT SPRINGS, AR
6	224TH CMBT COMMSQ	ANG	ST SIMONS ISLAND, GA
7	244TH CMBT COMM FLT	ANG	PORTLAND, OR
8	128TH TCF	ANG	MILWAUKEE, WI
9	104TH TCF	ANG	KLAMATH FALLS, OR
10	263RD CMBT COMM SQ	ANG	BADIN, NC
11	129TH TCS	ANG	KENNESAW, GA
12	282ND CMBTCS	ANG	COVENTRY, RI
13	113TH TCF	ANG	SYRACUSE, NY
14	75TH TCF	AF	ELGIN AFB, FL
15	222ND CMBT COMM SQ	ANG	COSTA MESA, CA
16	264TH CMBT COMM SQ	ANG	CHICAGO, IL
17	261ST CMBTCS	ANG	VAN NUYS, CA
18	138TH TCF	ANG	GREELEY, CO
19	71ST TCF	AF	MC DILL AFB, FL
20	103RD TCS	ANG	ORANGE, CT
21	265TH CMBTCS	ANG	PORTLAND, ME
22	226TH CMBTCS	ANG	GADSDEN, AL
23	111 CEM SQ	ANG	WILLOW GROVE, PA
24	267TH CMBTCS	ANG	WELLESLEY, MA
25	12TH TRS	AF	BERGSTROM AFB, TX
26	105TH TCS	ANG	CHENEY, WA
27	91ST TRS/DOTP	AF	BERGSTROM AFB, TX
28	1ST TRS/10TH TRW	AF	ALCONBURY, ENGLAND
29	10TH RTS	AF	ALCONBURY, ENGLAND
30	1ST CMBTCS	AF	LINDSEY AS, GERMANY
31	621ST TCF	AF	WIESBADEN AFB, GERMANY
32	38TH TRS/38TH TRW	AF	ZWEIBRUEN AFB, GERMANY
33	26TH TRW	AF	ZWEIBRUEN AFB, GERMANY
34	611TH TCF	AF	ALZEY, GERMANY
35	622ND TCF	AF	RHEIN GRAFENSTEIN, GERMANY
36	603RD TCS	AF	ALZEY, GERMANY
37	124TH TCF	ANG	CINCINNATI, OHIO
38	123RD TCF	ANG	CINCINNATI, OHIO
39	101ST TCS	ANG	WORCHESTER, MA
40	6906 ESS	AF	BROOKS AFB, TX
41	157 TCF	ANG	JEFFERSON BARRACKS, MO
42	256 CMBTCS (AFCH)	ANG	TACOMA, WA
43	112TH TCF	ANG	UNIVERSITY PARK, PA
44	629TH TCF	AF	SCHWIELENTROP, GERMANY
45	626TH TCF	AF	NORDHOLZ, GERMANY
46	619TH TCF	AF	SCHWIELENTROP, GERMANY

UNIT IDENTIFICATION

IDENT NO.	UNIT	TYPE	LOCATION
47	606TH TCS	AF	BREMERHAVEN, GERMANY
48	636TH TCF	AF	NORDHOLZ, GERMANY
49	727TH TCS	AF	EGLIN AFB, FL
50	81ST TCF	AF	KADENA AB, JAPAN
51	3RD CMBTCG	AF	TINKER AFB, OK
52	507TH TACCS	AF	SHAW AFB, SC
53	682ND ASOC	AF	SHAW AFB, SC
54	6948TH ESC	AF	SAN ANTONIO, TX
55	105TH CEM	ANG	WHITE PLAINS, NY
56	609TH TCS	AF	HESSISCH-OLDENDORF, GERMANY
57	107TH TCS	ANG	PHOENIX, AZ
58	244TH CMBTCS	ANG	PORTLAND, OR
59	6922ND ESS	AF	CLARK AB, PHILIPPINES
60	234TH CMBTCS	ANG	HAYWARD, CA
61	6911 ESG	AF	HAHN AB, GERMANY
62	621ST TCS	AF	OSAN, KOREA
	6130TH TCF	AF	OSAN, KOREA
	6140TH TCF	AF	OSAN, KOREA
63	728TH TCS	AF	DUKE FIELD, FL
64	2ND CMBTCG	AF	PATRICK AFB, FL
65	271ST CMBTCS	ANG	ANNVILLE, PA

UNIT DEPLOYMENTS

GEOGRAPHICAL AREA AND SEASON OF YEAR

IDENT NO.	WHERE DEPLOYED	SEASON
1	KOREA	ALL
2	KOREA	ALL
	PHILIPPINES	ALL
	JAPAN	ALL
	OKINAWA	ALL
	THAILAND	ALL
	VIETNAM	ALL
3	KOREA	ALL
4	NOT RECORDED	NOT RECORDED
5	TEXAS	SUMMER
6	SOUTH CAROLINA	WINTER
7	ALASKA	WINTER
	KOREA	SPRING
	MOJAVE DESERT	SUMMER
8	USA	SUMMER
9	ALASKA	WINTER
	DESERT	SUMMER
10	LOCAL AREAS	ALL
11	GEORGIA	SUMMER
12	CALIFORNIA	SPRING
	SOUTH CAROLINA	SPRING
	NEW JERSEY	WINTER
	ARIZONA	FALL
13	FT. DRUM	WINTER
	FT. DRUM	SUMMER
14	SOUTH CAROLINA	SUMMER
	FLORIDA	ALL
	LOS ANGELES	SPRING
15	CONUS	ALL
	OVERSEAS	ALL
16	FLORIDA	FALL
	NORTH CAROLINA	SPRING
	ILLINOIS	SUMMER/SPRING
	KOREA	FALL
17	CALIFORNIA	ALL
18	TEXAS	SPRING
19	FLORIDA	
20	TEXAS	SPRING
	SOUTH CAROLINA	SUMMER
	NEW YORK	WINTER
	NEW ENGLAND	SUMMER
21	NEW ENGLAND	SUMMER

UNIT DEPLOYMENTS

GEOGRAPHICAL AREA AND SEASON OF YEAR

IDENT NO.	WHERE DEPLOYED	SEASON
22	EGYPT	FALL
	KOREA	WINTER
	NORTH CAROLINA	FALL
	MISSISSIPPI	FALL
23	ALASKA	SUMMER/WINTER
	NEW YORK	SUMMER/WINTER
	SOUTH CAROLINA	SUMMER/WINTER
24	SOUTH CAROLINA	SUMMER
	NORTH CAROLINA	SUMMER
	FLORIDA	SUMMER
	EUROPE (Possible)	SUMMER
	FT. DRUM	WINTER
25	BERGSTROM AFB	ALL
26	OREGON	SUMMER
	WASHINGTON	WINTER/SUMMER
	PANAMA	WINTER
	SOUTH IDAHO	SUMMER
27	BERGSTROM AFB	SUMMER/WINTER
28	ALCONBURY ENGLAND	ALL
29	ALCONBURY ENGLAND	ALL
30	NORWAY	ALL
	MIDDLE EAST	ALL
	NORTH AFRICA	ALL
	EUROPE (CENTRAL)	ALL
31	EUROPE	ALL
32	NORMALLY NOT DEPLOYED	
33	NORMALLY NOT DEPLOYED	
34	EUROPE (CENTRAL)	ALL
35	ITALY	ALL
	GERMANY	ALL
	DENMARK	ALL
36	EUROPE	ALL
37	ALASKA	WINTER
	MICHIGAN	SUMMER
	FLORIDA	FALL
38	MICHIGAN	SUMMER
	FLORIDA	FALL
39	TEXAS	SUMMER
	FLORIDA	SUMMER/FALL
40	FLORIDA	FALL
	SOUTH CAROLINA	SPRING
	NEW MEXICO	SPRING
	TEXAS	SUMMER

UNIT DEPLOYMENTS
GEOGRAPHICAL AREA AND SEASON OF YEAR

IDENT NO.	WHERE DEPLOYED	SEASON
41	MISSISSIPPI	WINTER/SPRING
	MISSOURI	SUMMER
42	WASHINGTON	SUMMER/WINTER
	NEW MEXICO	WINTER
	KOREA	WINTER
	ALASKA	WINTER
	IDAHO	SUMMER
43	NORTH EAST USA	SUMMER
44	EUROPE	ALL
45	NORTHERN GERMANY	ALL
46	EUROPE	ALL
47	GERMANY	ALL
	SAUDI ARABIA	ALL
48	GERMANY	ALL
49	FLORIDA	ALL
50	NOT RECORDED	NOT RECORDED
51	WORLDWIDE	ALL
	SAUDI ARABIA	ALL
52	NEW YORK	WINTER
	SOUTH CAROLINA	SUMMER/SPRING
53	FLORIDA	FALL
	NORTH CAROLINA	SPRING
54	USA	ALL
55	NEW YORK	SUMMER/WINTER
	NORTH CAROLINA	SPRING
56	GERMANY	ALL
	DENMARK	ALL
57	SOUTHWEST USA	ALL
	PACAF	ALL
58	WORLDWIDE	ALL
59	PHILIPPINES	NOT RECORDED
60	CALIFORNIA	ALL
	WORLDWIDE	ALL
61	NOT RECORDED	NOT RECORDED
62	NOT RECORDED	ALL
63	NOT RECORDED	ALL
64	WORLDWIDE	ALL
65	CONUS	ALL

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE COMSEC

SHELTER TYPE S-141

QUESTION NUMBER	RESPONSE												
1	40	54	59	61									
2	3	15	1	3									
3	A	A	A	A									
4	0	0	0	0									
5	1	1	2	1									
6	4	2	6	4									
7	7	5	2	4.1									
8	0	0	0	0									
9	0	0	0	0									
10	1	5	-	0									
11	0	1	-	0									
12	0	0	0	-									
13	0	0	0	0									
14	0	3	0	0									
14A	0	1	0	0									
14B	0	2	0	0									
15	28	200	-	343									
15A	-	3	3	13									
16	17.5	12	10	0									
17	3.5	6	10	0									
17A	T/M	T/M	M	-									
17B	W/B	B/CH	-	-									
17C	W/M	C/M	-	-									
17D	2.5	2	0	0									
17E	21	21	15	0									
17F	371	200	80	8									
17G	3	25	0	0									
17H	1/2	4	1	2									
17I	30	6	25	4									
18	Y	Y	-	Y									
19	Y	Y	-	N									
20	Y	Y	-	N									

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE COMSEC

SHELTER TYPE S-280

QUESTION NUMBER	RESPONSE												
1	54												
2	2												
3	A												
4	0												
5	1												
6	2												
7	-												
8	0												
9	0												
10	1												
11	0												
12	0												
13	0												
14	1												
14A	0												
14B	1												
15	200												
15A	2												
16	10												
17	4												
17A	T/M												
17B	B/CH												
17C	C/W												
17D	3												
17E	21												
17F	100 -												
17G	25												
17H	4												
17I	4												
18	N												
19	Y												
20	Y												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE COMSEC

SHELTER TYPE 401

QUESTION NUMBER	RESPONSE												
1	61												
2	1												
3	A												
4	Q												
5	1												
6	5												
7	1												
8	0												
9	0												
10	0												
11	0												
12	0												
13	1												
14	0												
14A	0												
14B	0												
15	360												
15A	16												
16	0												
17	0												
17A	-												
17B	-												
17C	-												
17D	0												
17E	0												
17F	0												
17G	0												
17H	2/4												
17I	60												
18	Y												
19	N												
20	N												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE COMSEC

SHELTER TYPE S-514

QUESTION NUMBER	RESPONSE												
1	54	61											
2	11	3											
3	A	A											
4	Q	Q											
5	1	1											
6	2	6											
7	-	1.5											
8	0	0											
9	0	0											
10	0	0											
11	0	0											
12	0	0											
13	14	1											
14	-	0											
14A	-	0											
14B	-	0											
15	200	343											
15A	4	19											
16	8	0											
17	5	0											
17A	T/M	-											
17B	B/CH	-											
17C	C/W	-											
17D	2	0											
17E	21	0											
17F	200	0											
17G	25	0											
17H	3	2											
17I	10	-											
18	N	Y											
19	N	-											
20	Y	-											

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE COMSEC

SHELTER TYPE S-537

QUESTION NUMBER	RESPONSE											
1	54											
2	2											
3	A											
4	Q											
5	1											
6	2											
7	3											
8	0											
9	0											
10	0											
11	0											
12	0											
13	0											
14	0											
14A	0											
14B	0											
15	200											
15A	8											
16	30											
17	2											
17A	T/M											
17B	B/CA											
17C	C/W											
17D	Z											
17E	21											
17F	1000											
17G	10											
17H	2											
17I	6											
18	Y											
19	N											
20	Y											

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE COMSEC

SHELTER TYPE S-581

QUESTION NUMBER	RESPONSE												
1	61												
2	-												
3	A												
4	Q												
5	1												
6	-												
7	1.5												
8	0												
9	0												
10	0												
11	0												
12	0												
13	1												
14	0												
14A	0												
14B	0												
15	260												
15A	8												
16	0												
17	0												
17A	-												
17B	-												
17C	-												
17D	0												
17E	0												
17F	0												
17G	Q												
17H	2												
17I	-												
18	Y												
19	N												
20	N												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE COMSEC

SHELTER TYPE H-585

QUESTION NUMBER	RESPONSE												
1	54												
2	4												
3	A												
4	Q												
5	1												
6	2												
7	8												
8	0												
9	0												
10	1												
11	0												
12	0												
13	0												
14	2												
14A	1												
14B	2												
15	50												
15A	2												
16	6												
17	3												
17A	T/M												
17B	B/CH												
17C	W/C												
17D	2												
17E	21												
17F	200												
17G	25												
17H	1												
17I	2												
18	Y												
19	N												
20	-												

EQUIPMENT TYPE COMSEC

QUESTION NUMBER	RESPONSE
1	61
2	-
3	A
4	Q
5	1
6	-
7	.8
8	0
9	0
10	0
11	0
12	0
13	1
14	0
14A	0
14B	0
15	365
15A	24
16	0
17	0
17A	-
17B	-
17C	-
17D	0
17E	0
17F	0
17G	0
17H	2
17I	-
18	Y
19	N
20	N

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE COMSEC

SHELTER TYPE S-625

QUESTION NUMBER	RESPONSE												
1	61												
2	2												
3	A												
4	0												
5	1												
6	4												
7	5												
8	0												
9	0												
10	0												
11	0												
12	0												
13	0												
14	0												
14A	0												
14B	0												
15	-												
15A	-												
16	-												
17	-												
17A	T												
17B	CH												
17C	F												
17D	Z												
17E	-												
17F	8												
17G	0												
17H	2												
17I	-												
18	Y												
19	Y												
20	N												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE DSTE

M373A2E6
SHELTER TYPE M373A2E7

QUESTION NUMBER	RESPONSE												
1	42												
2	1												
3	I												
4	Q												
5	1												
6	10												
7	9												
8	0												
9	0												
10	0												
11	0												
12	0												
13	0												
14	4												
14A	1												
14B	1												
15	32												
15A	8												
16	4												
17	2												
17A	T												
17B	-												
17C	-												
17D	0												
17E	15												
17F	35												
17G	7.5												
17H	0												
17I	15												
18	Y												
19	N												
20	-												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE ES-57, 58, 59, 73, 65

SHELTER TYPE S-141

QUESTION NUMBER	RESPONSE									
1	25	27	28	32	33					
2	10	13	19	13	21					
3	A	A	A	A	A					
4	Q	Q	I	I	I					
5	1	1	1	1	1					
6	5	1	1.7	11	2.7					
7	13	5.3	11	10.6	9.5					
8	0	0	0	0	0					
9	0	0	0	0	0					
10	-	12	38	16	-					
11	0	0	1	1	0					
12	0	1	0	2	.5					
13	4.5	2	1.6	2	.5					
14	0	1	1.6	2	-					
14A	0	1.4	.2	.5	-					
14B	0	2.1	.3	.5	-					
15	345	365	260	312	<60					
15A	14	14	12	18	6.5					
16	1.3	2	1.6	4	.5					
17	2	1	.5	0	0					
17A	M	T	M	M	M					
17B	B	CA	B	B	B					
17C	M	M	M	M	M/F					
17D	0	Z	Z	0	Z					
17E	14	10	5	0	0					
17F	2	6	1.5	0	0					
17G	0	-	0	0	0					
17H	1/2	1	2/3	3	1					
17I	8	80	30	2	10					
18	-	-	-	-	-					
19	-	-	-	-	-					
20	-	-	-	-	-					

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE ES-60, 61, 63, 64, 72

SHELTER TYPE S-202

QUESTION NUMBER	RESPONSE									
1	25	27	28	32	33					
2	6	6	7	6	10					
3	A	A	A	A	A					
4	Q	Q	I	I	I					
5	1	1	1	1	1					
6	5	1	1.7	11	2.7					
7	13	2.5	13.2	9.9	9.5					
8	0	0	0	0	0					
9	0	0	0	0	0					
10	-	6	10	6	-					
11	0	0	1	0	0					
12	0	1	0	2	.5					
13	4.5	2	1.6	2	.5					
14	0	1	1.6	.5	-					
14A	0	1.4	.2	.5	-					
14B	0	2.1	.3	.5	-					
15	345	365	260	321	<60					
15A	14	14	12	18	6.5					
16	1.3	2	1.6	4	.5					
17	2	1	.5	0	0					
17A	M	T	M	M	M					
17B	R	CA	R	R	R					
17C	M	M	M	M	M/F					
17D	0	7	7	0	7					
17E	2	10	5	0	0					
17F	8	6	1.5	0	0					
17G	0	-	0	0	0					
17H	1/2	1	2/3	3	1					
17I	0	110	68	181	10					
18	-	-	-	-	-					
19	-	-	-	-	-					
20	-	-	-	-	-					

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE FS-6

SHELTER TYPE S-141

QUESTION NUMBER	RESPONSE												
1	25	27	28	29	32	33							
2	5	5	6	1	5	7							
3	A	A	A	A	A	A							
4	0	0	1	1	1	1							
5	1	1	1	1	1	1							
6	5	1	1.7	2	11	2.7							
7	13	10	13	<4	9	13.5							
8	0	0	0	0	0	0							
9	0	0	0	0	0	0							
10	-	5	9	1	4	-							
11	0	0	0	0	0	0							
12	0	1	.7	-	2	.5							
13	4.5	2	1	1	2	.5							
14	0	1	1	0	2	-							
14A	0	1.4	.2	0	.5	-							
14B	0	2.1	.3	0	.5	-							
15	345	365	260	365	312	<60							
15A	14	14	12	24	18	6.5							
16	0	2	.5	1	0	0							
17	2	1	.5	1	0	0							
17A	M	T	M	M	M	M							
17B	B	CA	B	B	B	B							
17C	M	M	M	M	M	M/F							
17D	-	Z	Z	Z	0	Z							
17E	14	10	5	0	0	0							
17F	2	6	1.5	<2	0	0							
17G	0	-	0	-	0	0							
17H	1/2	1	2/3	1/1	3	1							
17I	6	3	0	13	2	10							
18	-	Y	-	-	-	-							
19	0	Y	-	-	-	-							
20	-	N	-	-	-	-							

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE FS-7

SHELTER TYPE S-202

QUESTION NUMBER	RESPONSE									
1	25	27	28	32	33					
2	2	2	3	2	3					
3	A	A	A	A	A					
4	Q	Q	I	I	I					
5	1	1	1	1	1					
6	5	1	1.7	11	2.7					
7	13	2	13.5	12.5	-					
8	0	0	0	0	0					
9	0	0	0	0	0					
10	-	2	3	4	-					
11	0	0	0	0	0					
12	0	1	.7	2	.5					
13	4.5	2	1	2	.5					
14	0	1	1	2	-					
14A	0	2.1	.3	.5	-					
14B	0	2.1	.3	.5	-					
15	345	365	260	321	<60					
15A	14	14	12	18	6.5					
16	1	2	1	4	.5					
17	2	1	5	0	0					
17A	M	T	M	M	M					
17B	B	CA	B	B	B					
17C	M	M	M	M	M/F					
17D	-	Z	Z	0	Z					
17E	14	10	5	0	0					
17F	2	6	1.5	0	0					
17G	0	-	0	0	0					
17H	1/2	1	2/3	3	1					
17I	0	185	120	2	10					
18	-	Y	-	-	-					
19	-	Y	-	-	-					
20	-	N	-	-	-					

EQUIPMENT TYPE MDC

QUESTION NUMBER	RESPONSE
1	60
2	1
3	I
4	Q
5	1
6	1.5
7	9
8	0
9	0
10	0
11	0
12	1.5
13	0
14	4
14A	2
14B	3
15	4.5
15A	10
16	4.5
17	4
17A	T
17B	W
17C	F/W
17D	Z
17E	11
17F	250
17G	27
17H	1/2
17I	40
18	Y
19	Y
20	Y

EQUIPMENT TYPE M.D.E.

QUESTION NUMBER	RESPONSE
1	16
2	1
3	1
4	0
5	1
6	4
7	8
8	0
9	0
10	0
11	0
12	0
13	0
14	0
14A	0
14B	0
15	12
15A	7
16	1
17	3
17A	T
17B	-
17C	-
17D	.38
17E	30
17F	15
17G	0
17H	1/2
17I	5
18	Y
19	N
20	N

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE N.C.M.O.

SHELTER TYPE V-83

QUESTION NUMBER	RESPONSE												
1	16												
2	1												
3	1												
4	0												
5	1												
6	4												
7	9												
8	0												
9	0												
10	0												
11	0												
12	0												
13	0												
14	0												
14A	0												
14B	0												
15	0												
15A	0												
16	1												
17	3												
17A	1												
17B	-												
17C	-												
17D	.3												
17E	30												
17F	15												
17G	0												
17H	1/2												
17I	0												
18	Y												
19	N												
20	N												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE TTY/CRYPTO

SHELTER TYPE S-280

QUESTION NUMBER	RESPONSE											
1	60											
2	1											
3	I											
4	Q											
5	1											
6	1.5											
7	9											
8	0											
9	0											
10	0											
11	0											
12	1.5											
13	0											
14	4											
14A	2											
14B	3											
15	2											
15A	10											
16	4.5											
17	2											
17A	T											
17B	W											
17C	F/W											
17D	Z											
17E	11											
17F	250											
17G	27											
17H	1/2											
17I	40											
18	Y											
19	Y											
20	N											

EQUIPMENT TYPE UCP/JOB C

[illegible]

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE V-83

SHELTER TYPE V-83, S-121

QUESTION NUMBER	RESPONSE											
1	4	65										
2	9	4										
3	I	I										
4	Q	Q										
5	1	1										
6	-	9										
7	19	-										
8	0	0										
9	0	0										
10	0	0										
11	0	0										
12	0	1.5										
13	0	0										
14	0	1.5										
14A	0	1										
14B	0	2										
15	24	18										
15A	8	8										
16	2.5	1.5										
17	2.5	1.5										
17A	T	T										
17B	-	-										
17C	-	-										
17D	Z	Z										
17E	-	8.5										
17F	-	255										
17G	-	11										
17H	2	0										
17I	10	25										
18	Y	Y										
19	Y	N										
20	Y	N										

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TCC-76

S-517

SHELTER TYPE GMS-223, 514

QUESTION NUMBER	RESPONSE									
1	22	24	30	51	64					
2	2	2	1	2	2					
3	I	I	A	A	A					
4	0	0	I	0	0					
5	1	1	1	1	1					
6	24	-	1.5	2	5					
7	6	6.5	6.5	7	2.5					
8	0	0	0	0	0					
9	0	0	0	0	0					
10	0	0	0	0	1					
11	0	0	0	0	0					
12	0	0	0	0	0					
13	2	1	3	4	2					
14	1	0	3	4	2					
14A	.5	0	2	1.5	.5					
14B	.5	0	2	1.5	.5					
15	200	6	90	30	60					
15A	6	10	8	4	6					
16	2	1	2	5	2					
17	2	1	3	6	2					
17A	M	M	M	M	M					
17B	CA/B	B	B	-	B					
17C	M	-	M	-	M					
17D	1	-	1.5	-	Z					
17E	18	-	30	17	30					
17F	202	-	80	378	70					
17G	1	-	<5	8	1					
17H	1/4	4	2	4	0					
17I	8	-	24	40	45					
18	Y	Y	-	Y	Y					
19	N	Y	-	Y	Y					
20	N	Y	-	Y	N					

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TCC-77

SHELTER TYPE GMS-223, 515

QUESTION NUMBER	RESPONSE										
1	22	24	30	51	64						
2	1	1	1	1	1						
3	1	1	A	A	A						
4	0	0	1	0	0						
5	1	1	1	1	1						
6	24	-	1.5	2	5						
7	6	6.5	6.5	7	1						
8	0	0	0	0	0						
9	0	0	0	0	0						
10	0	0	0	1	1						
11	0	0	0	0	0						
12	0	0	0	0	0						
13	2	1	3	4	2						
14	1	0	3	4	2						
14A	.5	0	2	1.5	.5						
14B	.5	0	2	1.5	.5						
15	200	6	90	30	60						
15A	6	10	8	4	6						
16	2	1	2	5	2						
17	2	1	3	6	2						
17A	M	M	M	M	M						
17B	CA/B	B	B	-	B						
17C	M	-	M	-	M						
17D	1	-	1.5	-	2						
17E	18	-	30	17	30						
17F	202	-	80	378	70						
17G	1	-	<5	8	1						
17H	1/4	4	3	4	0						
17I	8	-	24	40	45						
18	Y	Y	-	Y	Y						
19	N	Y	-	Y	Y						
20	N	Y	-	Y	N						

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TGC-20

SHELTER TYPE S-291

QUESTION NUMBER	RESPONSE											
1	5	6	10	15	16	17	51					
2	1	1	1	1	1	1	2					
3	1	1	1	1	1	1	A					
4	Q	Q	Q	Q	Q	Q	Q					
5	1	2	1	1	1	1	1					
6	24	17.5	30	17	4	7.5	4					
7	5	7	8	11	11	6	17					
8	0	0	0	Z	0	0	0					
9	0	0	0	Z	0	0	0					
10	0	0	-	0	1	-	0					
11	0	0	0	0	0	-	0					
12	0	0	0	2	0	0	1					
13	0	0	0	0	0	0	0					
14	1	0	0	0	0	5	0					
14A	<1	0	0	0	0	2	0					
14B	<1	0	0	0	0	2	0					
15	60	100	30	8	12	50	30					
15A	6	7	6	6	7	12	8					
16	3	12	5.5	8	1	4	10					
17	2.5	3	4	4	3	4	6					
17A	T	-	M	M	-	-	M					
17B	CA	B	B	B	B	-	B					
17C	M	W	-	M	-	-	M					
17D	Z	-	Z	Z	.6	0	0					
17E	15	15	2	15	30	15	7					
17F	700	55	10	505	15	505	85					
17G	30	-	.5	0	0	27.5	20					
17H	0	0	0	1	1/2	0	-					
17I	40	70	50	10	15	30	10					
18	Y	N	Y	Y	Y	N	Y					
19	N	Y	N	Y	N	Y	N					
20	N	N	N	Y	N	N	N					

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TGC-26

SHELTER TYPE S-420, 421

QUESTION NUMBER	RESPONSE												
1	22	24	42	64									
2	4	4	1	4									
3	I	I	I	A									
4	0	0	0	0									
5	1	1	1	1									
6	24	-	10	5									
7	8	8	5	6									
8	0	0	0	0									
9	0	0	0	0									
10	0	2	1	1									
11	0	0	0	0									
12	0	0	0	0									
13	2.5	4	8	6									
14	1	4	1	2									
14A	.5	1	1	.5									
14B	.5	1	1	.5									
15	200	24	32	150									
15A	6	10	8	8									
16	2	4	12	10									
17	2	4	5	4									
17A	M	M	M	M									
17B	CA/B	B	-	B									
17C	M	-	M	M									
17D	7	7	1.5	7									
17E	18	-	22.5	24									
17F	202	1000	35	30									
17G	1	-	7.5	2									
17H	1/4	2/3	2/4	2/4									
17I	40	25	17.5	50									
18	Y	Y	Y	Y									
19	Y	Y	-	Y									
20	N	Y	-	Y									

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TGC-27

S-280
SHELTER TYPE S-422, OW-38

QUESTION NUMBER	RESPONSE												
1	2	4	7	9	18	22	24	26	30	42	43	51	57
2	1	1	1	1	1	1	1	1	3	1	1	3	1
3	A	I	I	I	I	I	I	I	A	I	I	A	I
4	I	Q	Q	Q	Q	Q	Q	Q	I	Q	Q	Q	Q
5	1	1	1	1	1	1	1	1	1	1	1	1	1
6	.25	-	26	10	7	24	-	4	7	10	16	4	9
7	-	9	5	3.7	2	8	9	9	9	5	1	9	5
8	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	3	0	0	0	0	0	0	0	0	1	0
13	4	0	0	0	0	0	0	4	.3	2	0	0	3
14	4	0	2	1	0	0	0	4	8	3	0	0	0
14A	1.5	0	1	1	0	.5	0	.75	2	1	0	0	0
14B	1	0	1	2	0	.5	0	.75	2	1	0	0	0
15	195	24	50	350	39	200	24	45	50	32	60	90	135
15A	8	8	8	24	8	6	10	6	8	8	7	8	9
16	-	2.5	6	1	2	2	1	3	-	12	2	10	3
17	4	2.5	5	1.5	2	3	4	3	8	5	2.5	12	3
17A	M	M	T	M	M	M	M	M	M	M	M/T	M	M
17B	B	-	CA	CH	B	CA/B	B	-	B	-	-	B	B
17C	M	-	W	F/4	M	M	W	M	M	M	F/C	M	M
17D	Z	Z	1	1	Z	1	Z	-	4	1.5	0	2	7
17E	12.8	-	20	17.5	15	18	270	17.5	30	22.5	30	37	22
17F	25	-	150	400	105	202	-	650	80	35	600	635	250
17G	5	-	2	15	17.5	1	-	50	<5	7.5	0	20	7
17H	2	2	-	2	1/2	0	2/3	1/1	1	0	0	-	0
17I	27.5	20	20	17.5	12.5	20	20	40	48	17.5	12	10	30
18	-	Y	Y	Y	Y	Y	Y	Y	-	Y	Y	Y	Y
19	-	N	Y	N	Y	Y	-	Y	-	N	N	N	N
20	-	N	N	Y	Y	N	-	Y	-	N	N	N	N

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TGC-27

OW-38

SHELTER TYPE S-280,422,

QUESTION NUMBER	RESPONSE												
1	60	64											
2	1	5											
3	I	A											
4	Q	Q											
5	1	1											
6	1.5	5											
7	9	4.5											
8	0	0											
9	0	0											
10	0	1											
11	0	0											
12	1.5	0											
13	0	0											
14	4	2											
14A	1.5	.5											
14B	1.5	.3											
15	24	100											
15A	10	8											
16	4.5	25											
17	4	10											
17A	M	M											
17B	B	B											
17C	-	M											
17D	Z	Z											
17E	11	24											
17F	300	70											
17G	27	2											
17H	1/2	1/2											
17I	10	50											
18	Y	Y											
19	N	N											
20	Y	N											

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TGC-28

SHELTER TYPE S-423

QUESTION NUMBER	RESPONSE																			
1	11	20	36	39	47	49	56	63												
2	1	1	2	1	2	1	1	1												
3	I	I	A	I	A	A	A	A												
4	0	0	1	1	0	0	0	0												
5	1	1	8	2	1	1	1	1												
6	25	20	2.1	14	1.5	1.5	-	4												
7	7	9	8.5	8.5	3.5	1.8	5	4												
8	0	0	0	0	0	0	0	0												
9	0	0	0	0	0	0	0	-												
10	0	0	3	0	0	1	1	-												
11	0	0	0	0	0	0	0	0												
12	0	0	2	-	0	0	0	4												
13	0	0	3	-	0	1	0	0												
14	1	0	0	-	0	0	0	-												
14A	.5	0	0	2	0	0	0	-												
14B	1	0	0	2	0	0	0	-												
15	270	100	312	-	150	365	280	300												
15A	8	6	10	-	-	8	12	8												
16	1	.5	3	-	4	0	4	-												
17	1	1.5	3	1	4	0	4	4												
17A	M	M	M	M	M	-	M	M												
17B	B	B	B	W	B	-	B	-												
17C	M	M	M	M/F	-	-	M	F												
17D	-	Z	0	.2	0	0	0	5												
17E	15	22.5	21	14	7	0	17	14												
17F	300	130	159	50	60	0	250	40												
17G	1.5	9	3	<3	5	0	10	10												
17H	1	0	2	-	0	-	0	2												
17I	10.5	7.5	20	-	20	8	11	20												
18	Y	Y	-	-	Y	Y	Y	-												
19	N	Y	-	-	N	N	Y	-												
20	N	Y	-	-	N	N	N	-												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TGC-621

SHELTER TYPE S-280

QUESTION NUMBER	RESPONSE											
1	1	62										
2	2	2										
3	A	A										
4	I	Q										
5	1	1										
6	.8	1.3										
7	1	.6										
8	0	0										
9	0	0										
10	0	0										
11	0	0										
12	0	5										
13	0	0										
14	0	10										
14A	0	1										
14B	0	1										
15	52	5										
15A	1	4										
16	0	10										
17	4.5	10										
17A	T	T										
17B	CA	CA										
17C	W	W										
17D	0	0										
17E	10.5	9										
17F	20	25										
17G	10	5										
17H	1/1	0										
17I	2	-										
18	-	Y										
19	-	N										
20	-	N										

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TMQ-28

S-517
SHELTER TYPE GMS-223, 515

QUESTION NUMBER	RESPONSE													
1	22	24	30	51	64									
2	3	3	2	3	3									
3	I	I	A	A	A									
4	0	0	I	Q	Q									
5	1	1	1	1	1									
6	24	-	1.5	2	5									
7	6	7	6.5	7	2.5									
8	0	0	0	0	0									
9	0	0	0	0	0									
10	0	0	0	0	1									
11	0	0	0	0	0									
12	0	0	0	0	0									
13	2	1	3	4	2									
14	1	0	3	4	2									
14A	.5	0	2	1.5	.5									
14B	.5	0	2	1.5	.5									
15	200	6	90	30	60									
15A	6	10	8	4	6									
16	2	1	2	5	2									
17	2	1	3	6	2									
17A	M	M	M	M	M									
17B	CA/B	B	B	-	B									
17C	M	-	M	-	M									
17D	-	-	1.5	-	Z									
17E	18	-	30	17	30									
17F	202	-	80	378	70									
17G	1	-	<5	8	1									
17H	1/4	4	3	4	0									
17I	5	-	24	40	45									
18	Y	Y	-	Y	Y									
19	N	Y	-	Y	Y									
20	N	Y	-	Y	N									

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TPB-1

SHELTER TYPE S-280

QUESTION NUMBER	RESPONSE												
1	1	14	34	62									
2	1	1	1	1									
3	A	A	A	A									
4	I	Q	I	Q									
5	1	1	6	1									
6	1	8	2.2	1.3									
7	1	1.5	1	1									
8	0	0	3.5	0									
9	0	0	0	0									
10	0	0	0	0									
11	0	-	-	0									
12	0	1.5	2.5	5									
13	0	1.5	0	0									
14	0	1.5	4	10									
14A	0	2	1	1									
14B	0	2	.5	1									
15	260	180	260	190									
15A	4	5	8	4									
16	0	6.5	4	10									
17	4.5	6.5	4	10									
17A	M/T	M	M	M									
17B	B	B	B	B									
17C	W/M	-	M	W									
17D	0	-	0	0									
17E	10.5	14	5	9									
17F	20	214	50	25									
17G	10	10.7	1	10									
17H	1/1	1/2	2	0									
17I	8	50	20	-									
18	-	Y	-	Y									
19	-	Y	-	N									
20	-	-	-	N									

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/MPN-14

SHELTER TYPE V96, 192, 209

QUESTION NUMBER	RESPONSE												
1	2	51	60	64									
2	2	4	1	3									
3	A	A	I	A									
4	I	Q	Q	Q									
5	1	2	1	1									
6	3	3.5	1.5	5									
7	2	2.9	1.5	2.7									
8	0	0	0	0									
9	0	Z	0	0									
10	1	2	0	2									
11	0	0	0	0									
12	1	3	1.5	0									
13	2	8	2	0									
14	0	8	1.5	6									
14A	1	1.5	1	1									
14B	2	2.5	1	.5									
15	260	210	0	200									
15A	8	8	24	6									
16	2	7	2	6									
17	2	3	2	6									
17A	M	T	T	T									
17B	B	CH	-	B									
17C	C/F	C	-	-									
17D	1	Z	Z	Z									
17E	112.5	90	11	7									
17F	5	1150	2050	50									
17G	1	10	27	1									
17H	1/5	4/6	1/6	3/6									
17I	16	22	100	30									
18	-	Y	Y	Y									
19	-	Y	N	Y									
20	-	Y	Y	N									

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TPN-19

SHELTER TYPE S520, 521

QUESTION NUMBER	RESPONSE												
1	51												
2	6												
3	A												
4	Q												
5	1												
6	3												
7	5.6												
8	-												
9	0												
10	0												
11	-												
12	.8												
13	2												
14	0												
14A	0												
14B	0												
15	153												
15A	4.7												
16	2												
17	1.5												
17A	M												
17B	B												
17C	M												
17D	Z												
17E	186												
17F	-												
17G	2												
17H	4/5												
17I	18												
18	N												
19	Y												
20	Y												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TPS-43

SHELTER TYPE G'S-177, S-409

QUESTION NUMBER	RESPONSE												
1	8	9	11	13	18	19	20	26	31	34	35	36	37
2	1	1	1	1	1	1	1	1	1	1	1	1	1
3	I	I	I	I	I	A	I	I	A	A	A	A	I
4	Q	Q	Q	Q	Q	Q	Q	Q	I	I	I	I	Q
5	1	1	1	1	1	1	1	1	5	6	6	8	1
6	7	10	25	16	7	.75	20	4	1.6	2.2	1.6	2.1	10
7	1	1	1	1.1	1	3	4	1.5	3.5	3.5	3	3	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	1	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	1	0	0	4	0	5	3	1
13	4	0	0	1	0	2	2	4	10	10	5	7	0
14	<1	1	1	2	0	0	0	1.5	4	10	5	7	0
14A	.25	1	.5	1.5	0	0	0	.75	2	.2	.2	1.4	0
14B	.5	2	1	1.5	0	0	0	.75	1	.5	.2	2.1	0
15	225	40	270	180	156	200	216	260	130	260	156	365	115
15A	6	24	8	7	6	10	6	6	8	8	10	24	8
16	4	1	1	2	2	6	1.5	3	6	10	5	7	2
17	2	1.5	1	1	2	6	1.5	2	4	10	5	7	1
17A	M	M	M	M	M	-	M	M	M	M	M	M	T
17B	B	CH	-	-	B	-	-	CA	B	B	B	B	CH
17C	M	4/F	M	-	M	-	-	M/F	M	M	M	M	F
17D	Z	1	-	Z	Z	Z	Z	-	0	1	0	0	-
17E	22.5	17.5	15	15	15	7	22.5	17.5	4	4	5	17.5	15
17F	675	400	300	90	105	180	130	650	50	50	50	180	-
17G	45	15	1.5	2	17.5	30	9	50	1	1	2.5	20	-
17H	2	2	1	3	0	2	1/2	2/4	2	2/3	2	2	2/3
17I	10	50	20	6	3.5	45	12.5	17.5	8	80	40	4	4
18	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	Y
19	N	N	N	N	N	N	N	N	-	-	-	-	N
20	N	Y	N	N	N	Y	N	N	-	-	-	-	N

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TPS-43

SHELTER TYPE S-177, 409

QUESTION NUMBER	RESPONSE											
1	38	39	41	43	44	45	46	47	48	49	50	56
2	1	1	1	1	1	1	1	1	3	1	1	1
3	I	I	I	I	A	A	A	A	A	A	A	A
4	Q	I	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
5	1	2	1	1	1	1	1	1	1	1	1	1
6	11	14	13	30	1.3	1.5	2	.5	.5	1.5	.1	-
7	1	3	1	1	3	3	2	3.2	1	1.5	.2	5
8	0	0	0	0	0	0	1	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	1	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	1	25	0	0	3	1	2	0	4	0	0	0
13	3	-	1	0	7	1	14	5	3	1	6	0
14	1	-	1	0	7	5	6	0	4	0	-	0
14A	.5	2	.5	0	1.7	-	1	0	.5	0	-	0
14B	1	2	.5	0	2.5	-	1	0	.7	0	-	0
15	230	-	200	190	300	250	220	260	300	365	300	280
15A	6	-	7	4	9	-	8	10	10	6	16	12
16	3	-	2	1	16	5	7	5	3	1	3	4
17	2	1	1	1	7	5	6	5	4	0	-	4
17A	M	M	M	M/T	M/T	M	M	M	M	-	M	M/T
17B	CH/B	W	B	W	-	B	B	B	W	-	B	CH
17C	M	-	M	C	4	M	M/4	-	C/4	-	-	M/W
17D	-	.2	1	0	0	0	0	0	0	0	-	0
17E	12.5	14	15	15	7	14	6	7	5	0	-	17
17F	800	50	30	0	350	100	40	25	59	0	-	250
17G	2.5	3	2	0	21	5	3	5	7	0	-	10
17H	2	1	2	1/2	1/3	3	2/3	2	2	-	2/3	2/3
17I	11	-	2	6	50	25	80	12	75	100	30	12.5
18	-	-	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
19	N	-	N	N	N	Y	Y	N	Y	Y	Y	Y
20	N	-	N	N	N	N	Y	N	Y	Y	N	Y

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TPS-43

SHELTER TYPE S-177, 409

QUESTION NUMBER	RESPONSE												
1	57	63											
2	1	-											
3	I	A											
4	Q	Q											
5	1	1											
6	9	4											
7	1.5	2											
8	0	0											
9	0	0											
10	0	0											
11	0	0											
12	0	5.5											
13	5	6											
14	0	-											
14A	0	-											
14B	0	-											
15	300	200											
15A	9	16											
16	5	6											
17	5	0											
17A	M	M											
17B	B	-											
17C	M	-											
17D	Z	0											
17E	30	0											
17F	130	0											
17G	7	0											
17H	-	2											
17I	30	6											
18	Y	Y											
19	N	N											
20	N	N											

EQUIPMENT TYPE AN/TPS-44

QUESTION NUMBER	RESPONSE
1	11
2	1
3	I
4	Q
5	1
6	12
7	9
8	0
9	0
10	1
11	0
12	0
13	3
14	2
14A	1
14B	1
15	200
15A	4
16	1
17	1
17A	M
17B	B
17C	M
17D	Z
17E	15
17F	300
17G	5.5
17H	0
17I	5
18	Y
19	Y
20	Y

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TRC-32

SHELTER TYPE S-73

QUESTION NUMBER	RESPONSE											
1	8	57										
2	2	4										
3	1	1										
4	0	0										
5	1	1										
6	13	9										
7	7	9										
8	0	0										
9	0	0										
10	0	0										
11	0	0										
12	0	0										
13	0	1.5										
14	1	0										
14A	.5	0										
14B	1	0										
15	100	300										
15A	2	9										
16	4	3										
17	1	3										
17A	T	T										
17B	CA	CH										
17C	W/F	W/F										
17D	2	0										
17E	15	15										
17F	675	250										
17G	1.5	7										
17H	2	-										
17I	10	24										
18	Y	Y										
19	N	Y										
20	N	N										

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TRC-36/61

S-150, W-196
SHELTER TYPE S-141, S-73, 675

QUESTION NUMBER	RESPONSE													
1	5	6	7	10	15	16	17	42	60	65				
2	8	8	5	8	8	8	8	2	4	10				
3	I	I	I	I	I	I	I	I	I	I				
4	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
5	1	2	1	1	1	1	1	1	1	1				
6	22	17.5	26	30	17	9	7.5	10	1.5	9				
7	20	17	5	5.6	17	16	6.7	5	4	6.2				
8	0	0	0	0	Z	0	0	0	0	0				
9	0	0	0	0	Z	0	0	0	0	0				
10	0	0	0	-	0	0	-	0	0	0				
11	0	0	0	0	0	0	-	0	0	0				
12	0	0	10	0	0	0	0	0	2	1.5				
13	0	0	0	0	0	0	0	0	0	1				
14	3	0	6	0	2/0	0	5	4	2.5	1.5				
14A	<1	0	1	0	.75	0	2	1	2	1				
14B	<1	0	1	0	.75	0	2	1	3	2				
15	20	100	75	15	4.5	26	50	32	8	22				
15A	6	7	8	6	2	3	12	8	24	8				
16	3	12	6	3.5	4.5	1	4	6	1.5	5.2				
17	2	12	10	3.5	2	1	5	2	7.5	3.8				
17A	T	T	T	T	T	T	T	T	T	T				
17B	CA	CA	CA	CA	CA	CA	W	CA	W	CH/CA				
17C	W	W	W	-	W	C	-	W	F/W	C				
17D	.2	-	1	Z	Z	Z	-	0	Z	Z				
17E	8.5	15	20	2	30	11	15	0	8.5	8.5				
17F	600	95	150	10	505	11	505	35	225	255				
17G	30	-	30	15	10	5	27.5	12.5	52	11				
17H	1	0	2	0	2/4	2	0	2/4	1/2	2.5				
17I	15	37	50	50	30	2	30	25	40	25				
18	Y	Y	Y	Y	Y	Y	-	Y	N	Y				
19	N	N	N	Y	-	Y	-	N	N	N				
20	N	N	N	N	-	N	-	N	N	N				

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TRC-87

SHELTER TYPE S-73, 285

QUESTION NUMBER	RESPONSE													
1	9	11	18	20	26	36	38	39	43	47	52	56	57	
2	1	2	1	3	3	4	1	3	1	3	1	3	3	
3	I	I	I	I	I	A	I	I	I	A	A	A	I	
4	0	0	0	0	0	I	0	I	0	0	0	0	0	
5	1	1	1	1	1	8	1	2	1	1	1	1	1	
6	10	25	7	20	-	2.1	22	14	16	.2	3	-	.1	
7	.25	2	.1	7.7	.5	12.4	7	8.5	4	4	1	5	9	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0	0	1	0	3	4	0	0	0	0	0	1	1	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0	0	0	0	0	7	0	0	0	1	0	0	0	
13	0	0	0	0	0	0	0	-	0	0	0	0	0	
14	1	1	1	0	0	-	1	-	0	0	5	0	0	
14A	1	.5	2	0	0	-	.5	2	0	0	<1	0	0	
14B	2	1	2	0	0	-	1	2	0	0	<1	0	0	
15	350	270	156	216	260	365	150	-	80	300	-	280	300	
15A	24	8	6	6	6	24	6	-	5	12	-	12	9	
16	1	1	2	1.5	-	-	3	-	2	4	12	4	3	
17	1.5	1	2	1.5	1.5	7	3	3	1	4	3	4	0	
17A	M	T	T	M	T	T	T	T	T	T	T	T/M	T	
17B	CH	CA	CA	-	CA/W	CA	CA	CH	W	CH	CH	B/CH	CH	
17C	4/F	W	W	-	-	W	F/W	F	F/C	W	W/F	W	F/W	
17D	1	-	Z	Z	-	0	-	.2	0	0	Z	0	0	
17E	17.5	15	15	22.5	17.5	10	23.5	1.4	15	18	30	17	15	
17F	400	300	105	130	650	150	1350	50	570	1400	-	250	250	
17G	15	1.5	17.5	9	50	<5	15	<3	0	50	-	10	7	
17H	2	1	1/2	0	1/1	2	0/1	0	0	1	1/2	2/3	0	
17I	17.5	12.5	12.5	12.5	10	30	6	-	10	10	5	12.5	24	
18	Y	N	Y	Y	N	-	Y	-	Y	N	Y	Y	Y	
19	N	N	N	N	Y	-	N	-	Y	Y	N	Y	N	
20	Y	N	N	N	Y	-	N	-	N	Y	N	Y	N	

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TRC-87

SHELTER TYPE S-73,285

QUESTION NUMBER	RESPONSE											
1	62	63										
2	-	2										
3	A	A										
4	Q	Q										
5	1	1										
6	1.3	4										
7	14	3										
8	0	-										
9	0	-										
10	1	1										
11	0	-										
12	0	4										
13	0	0										
14	0	-										
14A	0	-										
14B	0	-										
15	40	300										
15A	4	8										
16	1	5										
17	0	4										
17A	-	T										
17B	-	CA										
17C	-	F										
17D	0	1										
17E	0	14										
17F	0	40										
17G	0	10										
17H	0	2										
17I	-	20										
18	Y	N										
19	N	N										
20	N	N										

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TRC-96

SHELTER TYPE

QUESTION NUMBER	RESPONSE												
1	64												
2	4												
3	I												
4	Q												
5	I												
6	9												
7	4												
8	0												
9	0												
10	0												
11	0												
12	1.5												
13	0												
14	1.5												
14A	1												
14B	2												
15	18												
15A	8												
16	1.5												
17	1.5												
17A	M												
17B	B												
17C	M												
17D	Z												
17E	8.5												
17F	255												
17G	11												
17H	0												
17I	25												
18	Y												
19	N												
20	Y												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TRC-97

SHELTER TYPE S-308

QUESTION NUMBER	RESPONSE												
1	1	2	3	4	5	6	7	8	9	10	11	13	15
2	10	2	2	1	2	2	1	1	1	2	5	1	2
3	A	A	A	I	I	I	I	I	I	I	I	I	I
4	I	I	I	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
5	2	1	1	1	1	2	1	1	1	1	2	1	1
6	1	.25	.83	-	22	17.5	26	25	10	30	18.5	14	17
7	-	3	.58	8	13	1	2	2	5	4.5	6.8	14	12
8	0	0	0	0	0	0	0	0	0	0	0	0	Z
9	0	0	0	0	0	0	0	0	0	0	0	0	Z
10	1	0	0	0	0	2	0	0	0	0	1	0	2
11	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	10	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	3	0	0
14	0	0	0	0	3	0	6	0	1	0	2	2	2
14A	0	0	0	0	<1	0	1	0	1	0	1	1	.75
14B	0	0	0	0	<1	0	1	0	2	0	1	1	.75
15	52	270	260	24	20	100	150	50	350	15	270	70	1
15A	2	8	4	8	6	7	8	2	24	6	8	6	6
16	0	0	0	2.5	3	12	6	4	1	4.5	3.5	1	1
17	4.5	4	9	2.5	3	12	10	1	1.5	4	3.5	2	4
17A	T	T	T	T	T	T	T	T	T	T	T	T	T
17B	CA	CA	CH	-	CA	CA	CA	W	W	CA	CA	W	W
17C	W	W	W	-	F	F	W	F	F/4	-	F	F	W
17D	0	1	0	Z	.2	0	1	Z	1	Z	-	Z	Z
17E	10.5	13	4	-	8.5	15	20	15	17.5	2	8.5	2	30
17F	20	25	15	-	600	105	150	675	400	10	300	90	505
17G	10	5	20	-	30	-	30	1.5	15	.5	3	2	10
17H	1/1	2	0/1	2	1	0	-	0	2	0	1	1	2
17I	4	27.5	16	10	3	20	50	2	25	50	12.5	15	10
18	-	-	-	Y	N	N	Y	N	N	Y	N	Y	Y
19	-	-	-	N	Y	Y	N	Y	N	Y	Y	N	N
20	-	-	-	N	Y	N	N	Y	Y	N	Y	N	N

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TRC-97

SHELTER TYPE S-308

QUESTION NUMBER	RESPONSE												
1	16	17	18	20	21	23	26	30	31	34	35	36	37
2	2	2	1	4	2	2	4	8	1	7	1	16	1
3	I	I	I	I	I	I	I	A	A	A	A	A	I
4	0	0	0	0	0	0	0	I	I	I	I	I	0
5	1	1	1	1	1	1	1	1	5	6	6	8	1
6	9	7.5	7	20	15	12	4	1.5	<6.5	2.2	1.6	2.1	22
7	12	12	2	6.5	4	10.5	2.5	2.5	1.6	7.6	7	4.9	-
8	0	0	0	0	0	Z	0	0	1	0	0	.14	0
9	0	0	0	0	0	0	0	Z	0	0	0	0	0
10	6	2	1	0	0	0	0	0	0	5	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	4	1	5	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	4	1	0	0	4	4.5	6	4	6	5	0	1
14A	0	2	1	0	0	<1	.75	2	2	1	.25	-	.5
14B	0	2	1	0	0	<1	.75	2	1	.5	.25	-	1
15	40	90	60	100	25	100	50	120	130	260	234	365	75
15A	6	12	8	7	8	8	7	12	8	12	10	14	6
16	1.5	4	2	1.5	10	6	2.5	2	6	6	5	-	3
17	1.5	4	2	1.5	1	3	4	6	4	6	5	12	3
17A	T	T	T	T	T	T	T	T	T	T	T	T	T
17B	W	W	CA	CH	CA	CH/CA	CA	CH	CH	W	CA	CH	CH/CA
17C	C	F	W	-	F	F/W	F	F/W	W	W	W	F/W	F/W
17D	Z	2	Z	Z	Z	Z	-	3	0	0	0	0	-
17E	30	20	15	16	15	16.5	17.5	20	4	4	5	21	23.5
17F	30	505	105	130	112	200	650	150	50	20	50	100	1850
17G	13	26.5	17.5	9	0	9	50	20	1	1	2.5	3	15
17H	2/2	0	0	0	0	1	1/1	1	2	1/2	2	2	0/1
17I	3	30	4	12.5	25	10	2.5	36	4	4	5	21	23.5
18	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	N
19	N	N	N	N	-	N	N	-	-	-	-	-	N
20	Y	N	N	N	-	N	N	-	-	-	-	-	N

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TRC-97

SHELTER TYPE S-308

QUESTION NUMBER	RESPONSE												
1	38	39	41	43	44	45	46	47	48	50	51	52	53
2	1	5	1	1	1	1	1	8	8	2	7	3	2
3	I	I	I	I	A	A	A	A	A	A	A	A	A
4	Q	I	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
5	1	2	1	1	1	1	1	1	1	1	1	1	1
6	22	14	31	16	1.3	.8	3.5	3.5	.5	.1	.5	3	2
7	9	8.5	4	9	4	4	4.6	3.5	1	.2	3	3.7	3.8
8	0	0	0	0	0	0	1	0	0	-	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	-	1	1	0	0	0	0	-	0	-	1	2
11	0	-	0	0	0	0	0	0	0	-	1	0	0
12	0	.25	0	0	6	0	2	2	4	0	1	2.5	0
13	0	0	0	0	0	0	0	0	3	0	0	0	0
14	1	-	1	0	16	5	6	3	4	0	15	3.5	0
14A	.5	-	.5	0	1.4	-	1	.25	.5	0	2	<1	0
14B	1	-	1	0	1.4	-	1	.5	.8	0	2	<1	0
15	75	-	50	120	300	250	220	300	300	0	200	180	36
15A	6	-	7	6	9	0	8	10	10	0	6	8.5	8
16	3	-	1	.25	16	5	7	6	4	4	4	15	12
17	3	3	1	2.5	15	5	6	6	4	-	6	18	2
17A	T	T	T	T	T	T	T	T	M	T	T	T	T
17B	CH/W	CH	W	W	CH	CH	-	W	W	W/CH	CH	CH	CH
17C	F/W	F	F/W	F/C	4	C	4	F	4/C	W/F	F	W/F	F/W
17D	-	12	0	0	0	0	0	0	0	-	4	Z	Z
17E	23.5	18	15	30	7	14	6	17	5	-	18	30	30
17F	1850	50	-	480	350	100	30	100	59	-	500	1000	1000
17G	15	2	3	0	20	5	3	10	7	-	10	10	20
17H	1/1	1	-	0	1/3	3	1/2	1/1	2	0	1/2	0	1
17I	16	-	15	4	20	50	10	5	30	-	1	2	5
18	N	-	Y	Y	-	Y	N	Y	N	Y	N	N	N
19	N	-	Y	N	Y	N	N	N	N	N	N	Y	N
20	N	-	N	N	Y	N	N	N	N	N	Y	Y	N

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TRC-97

SHELTER TYPE S-308

QUESTION NUMBER	RESPONSE													
	55	56	57	58	60	62	63	64	65					
1														
2	2	10	4	2	1	5	11	6	2					
3	I	A	I	I	I	A	A	A	I					
4	Q	Q	Q	Q	Q	Q	Q	Q	Q					
5	1	1	1	1	1	1	1	1	1					
6	5	-	9	18	1.5	1.3	5	5	9					
7	5.5	5	3.5	12	7	-	4	3.3	10					
8	0	0	0	0	0	0	0	0	0					
9	0	0	0	0	0	0	0	0	0					
10	1	-	1	0	1	-	0	0	1					
11	0	0	0	0	0	0	1	0	0					
12	0	0	.75	0	1.5	5	0	0	1.5					
13	0	0	2	0	0	0	0	0	0					
14	0	0	0	1	2.5	10	21	0	1.5					
14A	0	0	0	1	2	1	3	0	1					
14B	0	0	0	2	2	1	4	0	2					
15	70	280	180	50	1.5	0	156	250	24					
15A	8	12	0	12	10	0	24	6	8					
16	10	4	3	4	1.5	0	35	80	3.5					
17	6	6	3	4	1.5	10	6	20	3.5					
17A	T	T	T	T	T	T	T	T	T					
17B	-	CH	CH	CH	W	CA	CA	CA	CA					
17C	F	W	F/W	W	F/W	W	F	F	C					
17D	-	-	Z	1	1	0	1	Z	Z					
17E	8	17	30	15	11	9	14	5	8.5					
17F	200	300	130	150	300	25	40	70	255					
17G	3	30	7	30	27	10	10	2	11					
17H	1	0	0	0	1/2	0	-	0	1/2					
17I	20	9	30	27	20	-	15	4	15					
18	Y	Y	Y	Y	Y	Y	Y	Y	N					
19	N	Y	N	N	Y	N	Y	N	Y					
20	N	N	N	N	N	N	N	Y	N					

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/MRC-113		SHELTER TYPE S-456, 458 S-385, 386											
QUESTION NUMBER	RESPONSE												
1	12												
2	1(15)												
3	I												
4	Q												
5	1												
6	5												
7	4												
8	0												
9	0												
10	14												
11	0												
12	0												
13	0												
14	0												
14A	0												
14B	0												
15	227												
15A	18												
16	1												
17	1												
17A	M												
17B	-												
17C	W												
17D	1												
17E	45												
17F	4000												
17G	10												
17H	2/4												
17I	7.4												
18	Y												
19	Y												
20	Y												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TRC-136

SHELTER TYPE S-318, 437

QUESTION NUMBER	RESPONSE											
1	7	17	30									
2	1	1	2									
3	I	I	A									
4	0	0	I									
5	1	1	1									
6	26	7.5	1.5									
7	5	1	8.7									
8	0	0	0									
9	0	0	0									
10	0	-	0									
11	0	0	0									
12	3	0	0									
13	0	0	0									
14	2	0	20									
14A	1	0	2									
14B	1	0	2									
15	75	30	50									
15A	8	4	8									
16	6	1	2									
17	5	0	20									
17A	T	T	T									
17B	CA	W	CH									
17C	W	F	W/F									
17D	-	-	10									
17E	-	0	10									
17F	150	0	80									
17G	2	0	<5									
17H	1	1	1									
17I	50	30	24									
18	Y	Y	-									
19	N	N	-									
20	N	N	-									

EQUIPMENT TYPE AN/GRM-9

QUESTION NUMBER		RESPONSE
1	1	
2	1	
3	A	
4	I	
5	J	
6	1	
7	-	
8	0	
9	0	
10	0	
11	0	
12	0	
13	0	
14	0	
14A	0	
14B	0	
15	260	
15A	4	
16	0	
17	4, 5	
17A	T	
17B	CA	
17C	W	
17D	0	
17E	10.5	
17F	20	
17G	10	
17H	1/1	
17I	8	
18	-	
19	-	
20	-	

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/GRM-32

SHELTER TYPE S-280

QUESTION NUMBER	RESPONSE												
1	3												
2	1												
3	A												
4	I												
5	1												
6	.8												
7	1.1												
8	0												
9	0												
10	0												
11	0												
12	0												
13	0												
14	-												
14A	-												
14B	-												
15	12												
15A	8												
16	2												
17	2												
17A	T												
17B	CA												
17C	W												
17D	0												
17E	4												
17F	15												
17G	20												
17H	2/2												
17I	96												
18	-												
19	-												
20	-												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/GRM-48

SHELTER TYPE S-141

QUESTION NUMBER	RESPONSE									
1	4	23	41	60						
2	1	2	1	1						
3	1	1	1	1						
4	0	0	0	0						
5	2	1	1	1						
6	-	12	13	1.5						
7	-	9	4	12						
8	0	2	0	0						
9	0	0	0	0						
10	0	0	0	0						
11	0	0	0	0						
12	0	0	0	1.5						
13	0	0	0	0						
14	0	4	0	1.5						
14A	0	<1	0	1						
14B	0	<1	0	2						
15	-	260	30	1.5						
15A	8	24	6	10						
16	-	-	1	1.5						
17	0	3	1	1.5						
17A	-	T	T	T						
17B	-	CA/CH	W	W						
17C	-	W	W	F						
17D	-	Z	0	Z						
17E	-	16.5	15	8.5						
17F	-	202	50	250						
17G	-	9	10	27						
17H	2	1	1	1/2						
17I	10	2	2	20						
18	Y	N	Y	Y						
19	N	N	N	N						
20	N	N	N	N						

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/GRM-85

SHELTER TYPE S-280

QUESTION NUMBER	RESPONSE									
1	3	31	34	35	36	44	46			
2	1	1	1	1	2	1	1			
3	A	A	A	A	A	A	A			
4	I	I	I	I	I	Q	Q			
5	1	5	6	6	8	1	1			
6	.8	1.6	2.2	1.6	2.1	1.3	2			
7	6	-	-	4.5	10	4.2	5			
8	0	1	0	0	0	0	1			
9	0	0	0	0	0	0	0			
10	0	-	2	2	0	1	2			
11	0	0	0	0	0	0	0			
12	0	4	0	5	7	7	2			
13	0	0	0	0	0	0	0			
14	0	4	-	5	2	7	6			
14A	0	2	-	.3	1.4	1.4	1			
14B	0	1	-	.3	2.1	6.3	1			
15	52	130	260	156	365	300	10			
15A	<1	8	8	10	24	2	2			
16	9	6	-	5	-	7	7			
17	9	4	3	5	7	7	6			
17A	M	M	M	M	M	T	M			
17B	R	R	R	R	R	CH	-			
17C	M	M	M	M	M	4	4			
17D	0	0	0	0	0	0	0			
17E	4	4	3	5	10	7	6			
17F	15	50	30	50	150	350	30			
17G	20	1	5	2.5	<5	21	3			
17H	1/2	2	2	2	2	1/3	1/2			
17I	3.5	2	1	10	2	4	2			
18	-	-	-	-	-	Y	Y			
19	-	-	-	-	-	N	Y			
20	-	-	-	-	-	N	Y			

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/GRM-94

SHELTER TYPE S-194, 280

QUESTION NUMBER	RESPONSE												
1	4	8	18	20	23	26	31	34	35	36	39	43	44
2	2	1	1	1	2	1	1	1	1	2	1	1	1
3	I	I	I	I	I	I	A	A	A	A	I	I	A
4	Q	Q	Q	Q	Q	Q	I	I	I	I	I	Q	Q
5	1	1	1	1	1	1	1	6	6	8	2	1	1
6	-	13	7	20	12	4	.8	2.2	1.6	2.1	14	16	1.3
7	7	10	6	13	9	4	13.5	12.5	14.5	7	10	10	5
8	0	0	0	0	2	0	1	0	1	0	-	0	0
9	0	0	0	0	0	0	0	0	0	0	-	0	0
10	0	0	0	0	0	0	1	1	1	1	0	0	0
11	0	0	0	0	0	0	0	0	0	0	-	0	0
12	0	0	0	0	0	0	4	0	5	7	.25	0	6
13	0	0	0	0	0	0	0	0	-	0	-	0	0
14	0	1	1	0	4	2.5	4	3	5	-	-	0	6
14A	0	.5	2	0	<1	.75	2	1	.3	-	2	0	1.2
14B	0	1	1	0	<1	.75	1	.5	.3	-	2	0	6.3
15	-	180	24	100	75	75	130	260	156	365	-	50	300
15A	8	1	8	7	8	7	8	8	10	24	-	7	8
16	-	4	2	1.5	2	2.5	6	3	5	-	-	1	16
17	0	1	2	1.5	3	1.5	4	3	5	7	1	1	7
17A	-	T/M	M	M	M	M	M	M	M	M	M	T/M	M
17B	-	CA/B	B	B	CH	B	B	B	B	B	W	W	B
17C	-	W/M	M	M	M	M	M	M	M	M	M	F/C	M
17D	7	7	7	7	7	-	0	0	0	0	.2	0	0
17E	0	15	15	22.5	16.5	17.5	4	3	5	10	18.5	15	7
17F	0	675	105	130	202	650	50	30	50	150	50	480	350
17G	0	1.5	17.5	9	9	50	1	5	2.5	<5	<3	0	20
17H	2	2	1/2	0	1	1/1	2	2	2	2	-	1/2	1/3
17I	10	20	12.5	12.5	20	15	280	25	40	15	-	10	25
18	Y	Y	Y	Y	Y	Y	-	-	-	-	-	Y	Y
19	N	N	N	Y	N	N	-	-	-	-	-	N	N
20	N	N	N	Y	N	N	-	-	-	-	-	N	N

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/GRM-94

SHELTER TYPE S-194,208

QUESTION NUMBER	RESPONSE											
1	46	47	48	57	60	62	63					
2	1	1	3	1	1	1	1					
3	A	A	A	I	I	A	A					
4	Q	Q	Q	Q	Q	Q	Q					
5	1	1	1	1	1	1	1					
6	1.5	3.5	.5	9	1.5	1.3	-					
7	4	3.5	1	3	13	4	14					
8	1	0	0	0	0	0	-					
9	0	0	0	0	0	0	-					
10	2	0	2	0	0	0	-					
11	0	0	0	0	0	0	-					
12	2	4	4	0	3	5	-					
13	0	0	3	0	0	0	-					
14	6	4	4	0	2.5	10	-					
14A	1	.5	.5	0	1	1	-					
14B	1	1	.8	0	2	1	-					
15	220	330	300	180	1.5	190	-					
15A	6	12	10	9	12	4	-					
16	7	4	4	3	1.5	10	-					
17	6	4	4	3	4.5	10	-					
17A	M	M	M	M	T	T	-					
17B	B	-	W	B	W	CA	-					
17C	4	C/M	C/4	M	F	W	-					
17D	0	0	0	Z	Z	0	-					
17E	6	35	5	15	8.5	9	-					
17F	30	100	59	250	250	25	-					
17G	3	10	7	7	27	10	-					
17H	2/3	1	2	-	1/2	0	-					
17I	12	20	-	18	20	-	-					
18	Y	Y	-	Y	Y	Y	Y					
19	N	N	-	Y	N	N	Y					
20	N	N	-	N	N	N	N					

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TRN-26

SHELTER TYPE S-600

QUESTION NUMBER	RESPONSE												
1	64												
2	1												
3	A												
4	Q												
5	1												
6	5												
7	.1												
8	0												
9	0												
10	0												
11	0												
12	0												
13	0												
14	0												
14A	0												
14B	0												
15	120												
15A	5												
16	7												
17	-												
17A	M												
17B	B												
17C	M												
17D	Z												
17E	-												
17F	-												
17G	-												
17H	1/2												
17I	17												
18	Y												
19	N												
20	N												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TRN-31

SHELTER TYPE S-76

QUESTION NUMBER	RESPONSE												
1	51												
2	9												
3	A												
4	Q												
5	1												
6	4												
7	-												
8	-												
9	1												
10	-												
11	-												
12	0												
13	0												
14	-												
14A	-												
14B	-												
15	180												
15A	6												
16	30												
17	5												
17A	-												
17B	M												
17C	C												
17D	-												
17E	-												
17F	-												
17G	-												
17H	3												
17I	20												
18	Y												
19	N												
20	N												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSC-15

SHELTER TYPE S-155,208, 308

QUESTION NUMBER	RESPONSE												
1	3	6	8	9	10	16	18	21	38	43	52	63	
2	2	1	1	1	1	1	1	1	1	1	1	2	
3	A	I	I	I	I	I	I	I	I	I	A	A	
4	I	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
5	1	2	1	1	1	-	1	1	1	1	1	1	
6	.8	17.5	13	10	30	-	7	15	22	16	3	4	
7	1.1	11	2	1.5	6	-	1	10	9	4	2	3	
8	0	0	0	0	0	0	0	0	0	0	0	-	
9	0	0	0	0	0	0	0	0	0	0	0	-	
10	0	0	0	0	-	0	1	0	0	1	-	0	
11	0	0	0	0	0	0	0	0	1	0	3	-	
12	0	0	0	0	0	0	0	0	0	0	0	4	
13	0	0	0	0	0	0	0	0	0	0	0	0	
14	-	0	1	1	0	0	1	0	1	0	5	-	
14A	-	0	.5	1	0	0	1	0	.5	0	<1	-	
14B	-	0	.8	2	0	0	1	0	1	0	<1	-	
15	12	100	100	35	15	0	39	25	30	60	-	52	
15A	8	6	2	24	6	0	8	8	6	7	-	8	
16	2	12	4	1	4.5	0	2	10	3	2	12	1	
17	2	6	1	1.5	2	0	2	1	3	2.5	3	1	
17A	T	T	T	T	T	-	T	T	T	T	T	T	
17B	CA	CA	CA	W	CA	-	CA	CA	CH/W	W	CH	CA	
17C	W	F	F/W	4/F	-	-	W	F	F	F/C	W/F	F	
17D	0	-	Z	1	Z	0	Z	0	-	0	Z	1	
17E	4	15	15	17.5	2	0	15	15	23.5	30	30	14	
17F	15	20	675	400	10	0	105	112	1850	570	-	40	
17G	20	-	1.5	15	.5	0	17.5	0	15	0	-	10	
17H	2/2	0	2	2	2	-	1/2	0	2/2	1/2	1/2	2	
17I	32	10	10	25	50	-	7.5	25	16	10	5	20	
18	-	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	
19	-	N	Y	N	Y	N	N	N	Y	N	Y	Y	
20	-	N	Y	Y	N	N	N	N	N	N	N	N	

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/MSG-22

SHELTER TYPE V83

QUESTION NUMBER	RESPONSE									
1	10	5	15	16	60					
2	1	1	1	1	1					
3	I	I	I	I	I					
4	Q	Q	Q	Q	Q					
5	1	1	1	1	1					
6	30	24	17	4	1.5					
7	12	10	12	10	9					
8	0	0	Z	0	0					
9	0	0	Z	0	0					
10	-	0	0	1	0					
11	0	0	0	0	0					
12	0	0	2	0	1.5					
13	0	0	0	0	2.5					
14	0	1	0	0	2.5					
14A	0	<1	0	0	1.5					
14B	0	<1	0	0	3					
15	30	60	12	12	24					
15A	6	6	6	7	10					
16	5.5	3	12	1	4.5					
17	4	2.5	4	3	2					
17A	M	T	M	-	T					
17B	B	CA	-	B	-					
17C	-	W	-	-	-					
17D	Z	Z	Z	.6	Z					
17E	2	15	15	30	11					
17F	10	700	505	15	250					
17G	.5	30	0	0	27					
17H	0	0	1	1/2	1/2					
17I	50	17.5	20	20	20					
18	Y	Y	Y	Y	N					
19	Y	N	N	N	Y					
20	N	N	N	N	N					

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSC-38

SHELTER TYPE S-414

QUESTION NUMBER	RESPONSE											
1	12											
2	2											
3	1											
4	0											
5	1											
6	5											
7	4											
8	0											
9	0											
10	2											
11	0											
12	0											
13	0											
14	0											
14A	0											
14B	0											
15	50											
15A	8											
16	2											
17	2											
17A	M											
17B	-											
17C	W											
17D	2											
17E	15											
17F	500											
17G	10											
17H	1/2											
17I	3											
18	Y											
19	Y											
20	Y											

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSC-53

SHELTER TYPE S-387

QUESTION NUMBER	RESPONSE												
1	11	13	31	34	35	37	41	44	45	46	48	50	
2	1	1	1	1	1	1	1	1	1	1	1	1	
3	I	I	A	A	A	I	I	A	A	A	A	A	
4	0	0	I	I	I	0	0	Q	Q	Q	Q	Q	
5	1	1	5	6	6	1	1	1	2	1	1	1	
6	12	20	1.6	2.2	1.6	6	31	1.3	1.5	1.5	.5	.1	
7	9	8	13.8	12.5	<13	6	4	5	4	4.6	1	.2	
8	0	0	1	0	0	0	-	0	0	1	0	0	
9	0	0	0	0	0	0	-	0	0	0	0	0	
10	0	2	1	2	2	-	-	1	0	0	2	1	
11	0	0	0	0	0	0	-	0	0	0	0	0	
12	0	0	4	0	5	1	0	6	0	2	4	0	
13	3	3	10	0	0	0	2	0	0	14	3	6	
14	2	2	4	3	5	1	1	16	5	6	4	-	
14A	1	1.5	2	1	.2	1	.5	1.4	-	1	.5	-	
14B	1	1.5	1	.5	.2	1	1	6.3	-	1	.8	-	
15	200	180	130	260	156	125	175	300	250	145	300	300	
15A	6	7	8	8	10	8	6	8	-	8	10	16	
16	1	2.5	6	3	5	2	2	16	5	7	4	3	
17	1	2.5	4	3	5	1	1	7	5	6	-	-	
17A	M	M	M	M	M	M	M	M	M	M	M	M	
17B	-	-	B	B	B	CA	B	B	B	B	W	B	
17C	M	-	M	M	M	M	M	M	M	4	C/4	-	
17D	2	2	0	0	0	2	0	0	0	0	0	-	
17E	15	<20	4	3	5	15	15	7	14	6	5	-	
17F	300	90	50	30	50	500	-	350	100	30	59	-	
17G	5.5	2	1	5	2.5	2	2	20	5	3	7	-	
17H	3	1/2	4	2	2	4	2	1/3	2	2/4	2	0	
17I	20	20	64	25	80	10	15	30	25	23	15	15	
18	Y	Y	-	-	-	Y	Y	Y	Y	Y	Y	Y	
19	N	Y	-	-	-	N	Y	N	Y	Y	N	N	
20	N	Y	-	-	-	N	N	N	Y	Y	N	N	

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSC-60

SHELTER TYPE S-448, S-449, S-450

QUESTION NUMBER	RESPONSE												
1	1	2	3	4	5	6	7	10	11	15	16	17	20
2	2	2	1	1	2	1	1	1	3	2	1	1	3
3	A	A	A	I	I	I	I	I	I	I	I	I	I
4	I	I	I	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
5	1	1	1	1	1	2	1	1	1	1	1	1	1
6	1	.25	.83	-	19	17.5	26	30	25	17	-	7.5	20
7	1.5	3	.5	8	2	1.5	2	2	3.3	.5	1.5	2.5	4.3
8	0	0	0	0	0	0	0	0	0	Z	0	0	0
9	0	0	0	0	0	0	0	0	0	Z	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	3	0	0	0	0	0	0
13	0	4	0	0	0	0	0	0	0	0	0	0	0
14	-	4	-	0	2	0	2	0	1	0	0	4	0
14A	-	1.5	-	0	<1	0	1	0	.5	0	0	2	C
14B	-	1	-	0	<1	0	1	0	1	0	0	2	0
15	130	270	60	24	25	100	75	15	270	4	-	50	100
15A	3	8	6	8	6	7	8	6	8	6	-	12	6
16	0	-	-	2.5	5	12	6	8	1	4	3	4	1.5
17	0	4	11	2.5	3	4	7	2	1	4	2	4	1.5
17A	M	M	T	M	M	M	T	T	M	M	T	M	M
17B	B	B	CA	B	B	B	CA	CA	B	B	B	B	B
17C	W	M	W	-	W	M	W	-	M	M	-	M	M
17D	0	1	0	Z	.2	-	1	Z	-	Z	-	-	Z
17E	0	12.8	4	-	8.5	15	20	2	15	30	20	15	16
17F	0	25	15	-	600	125	150	10	300	505	16	505	130
17G	0	5	20	-	3.5	-	2	.5	1.5	0	1	11.5	9
17H	1/1	2	0/1	2	0	0	-	0	1	1	0	0	1/2
17I	6	27.5	30	10	15	37	50	50	12.5	10	30	30	12.5
18	-	-	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
19	-	-	-	N	N	N	N	N	Y	N	N	N	N
20	-	-	-	N	N	N	N	N	Y	N	N	N	N

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSC- 60

SHELTER TYPE S-448,S-449, S-450

QUESTION NUMBER	RESPONSE													
1	21	22	23	24	26	30	36	39	42	47	49	51	52	
2	1	4	1	4	3	3	6	3	2	4	2	6	4	
3	I	I	I	I	I	A	A	I	I	A	A	A	A	
4	Q	Q	Q	Q	Q	I	I	I	Q	Q	Q	Q	Q	
5	1	1	1	1	1	1	3	2	1	1	1	1	1	
6	15	24	12	-	4	-	2.1	14	10	.2	1.5	.5	3	
7	2	9	3	9	1.8	9	4.2	4	2	3.5	1.5	2	3	
8	0	0	Z	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	Z	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	-	0	0	-	0	1	
11	0	0	0	0	0	0	0	-	0	0	0	0	0	
12	0	0	0	0	0	0	7	.25	0	1	0	0	0	
13	0	0	4	0	2.5	0	1	0	0	0	2	0	0	
14	0	0	4	0	2.5	6	7	-	3	0	0	6	-	
14A	0	0	<1	0	.75	2	<1	2	1	0	0	.5	-	
14B	0	0	<1	0	.75	2	<1	-	1	0	0	.5	-	
15	25	200	200	24	90	100	365	-	32	330	200	200	-	
15A	8	6	8	10	8	8	16	-	8	12	4	5	-	
16	10	3	2	1	1.5	2	-	-	13	4	4	20	12	
17	1	3	3	4	1.5	6	7	1	4	4	1	6.7	3.7	
17A	M	M	M	M	M	M	M	M	M	M	T	-	M	
17B	CA	CA/B	CH	B	B	B	B	B	B	B	W	-	B	
17C	-	M	M	-	M	M	M	M	M	M	F/C	-	M	
17D	0	1	Z	-	-	3	0	.2	1.5	0	0	5	Z	
17E	15	18	16.5	-	11	30	10	18	22.5	18	90	10	30	
17F	112	202	202	-	650	80	150	50	35	1400	50	1000	-	
17G	0	1	9	-	50	5	5	3	12.5	50	10	2	-	
17H	0	1	1	2/3	1/1	1	2	1	0	1	-	1	1/1	
17I	25	12	10	20	10	24	30	-	17.5	10	6	15	5	
18	Y	Y	Y	Y	Y	-	-	-	Y	Y	Y	Y	Y	
19	N	N	N	-	Y	-	-	-	N	N	N	Y	N	
20	N	N	N	-	N	-	-	-	N	N	N	Y	N	

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSC-60

SHELTER TYPE S-448,449,450

QUESTION NUMBER	RESPONSE													
	53	55	57	58	60	62	63	64	65					
1														
2	1	1	3	1	2	2	3	4	2					
3	A	I	I	I	I	A	A	A	I					
4	Q	Q	Q	Q	Q	Q	Q	Q	Q					
5	1	1	1	1	1	1	1	1	1					
6	1.7	5	9	18	1.5	1.3	4	5	9					
7	3	2	2	.8	3.8	1.5	3	6	2					
8	0	0	0	0	0	0	0	0	0					
9	0	0	0	0	0	0	-	0	0					
10	0	0	0	0	0	0	1	1	0					
11	0	0	0	0	0	0	0	0	0					
12	0	0	0	0	1.5	0	4	1.5	1.5					
13	0	0	3	0	0	0	0	0	1					
14	4	0	0	1	2.5	0	-	4	1.5					
14A	.5	0	0	1	2	0	-	.3	1					
14B	.5	0	0	2	2	0	-	.5	2					
15	160	50	180	30	50	40	300	180	20					
15A	6	8	9	12	12	4	8	8	8					
16	12	3.5	3	4	10	1	5	10	5					
17	5.5	3	3	4	4.5	0	4	4.5	1.5					
17A	M	M	M	T	M	-	T	M	M					
17B	B/CH	B	B	CH	B	-	CH	B	W					
17C	W/F	M	M	H	M	W	F	M	M					
17D	Z	-	Z	1	1	0	1	Z	Z					
17E	14	15	15	15	11	0	14	21	8.5					
17F	605	200	250	80	250	0	40	60	255					
17G	6	3	7	10	27	0	10	4	11					
17H	1/2	1/2	0	0	1/2	0	2	1/2	0					
17I	20	20	24	27	20	-	20	30	25					
18	Y	Y	Y	Y	Y	Y	Y	Y	Y					
19	Y	N	N	N	Y	N	N	Y	N					
20	Y	N	N	Y	Y	N	N	Y	N					

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSC-62

SHELTER TYPE S-424,423

QUESTION NUMBER	RESPONSE												
1	2	4	7	11	20	22	24	26	30	36*	39	42	47
2	1	1	1	1	1	1	1	1	2	2	2	1	1
3	A	I	I	I	I	I	I	I	A	A	I	I	A
4	I	0	0	0	0	0	0	0	I	I	I	Q	Q
5	1	1	1	1	1	1	1	1	1	8	2	1	1
6	.25	-	26	25	20	24	-	4	1.5	2.1	-	10	3.5
7	-	9	1	7	9	9	9	3.5	-	9	8.5	5	3.5
8	0	0	0	0	0	0	0	0	0	<.14	-	0	0
9	0	0	0	0	0	0	0	0	0	0	-	0	0
10	0	0	0	0	1	0	0	0	0	2	-	0	0
11	0	0	0	0	0	0	0	0	0	0	-	0	0
12	0	0	3	0	0	0	0	0	0	0	.25	0	2
13	4	0	0	0	0	0	0	5	0	2	0	4	2
14	4	0	2	1	0	0	0	5	6	2	-	4	4
14A	1.5	0	1	.5	0	0	0	.75	2	.25	2	1	.5
14B	1	0	1	1	0	0	0	.75	2	.4	2	1	1
15	270	24	75	270	100	200	24	55	100	365	-	32	300
15A	8	8	8	8	6	6	10	7	8	14	-	8	10
16	-	2.5	6	1	1.5	2	1	4	2	-	-	12	4
17	4	2.5	5	1	1.5	3	4	3	6	3	1	5	4
17A	M	M	T	M	M	M	M	M	M	M	M	M	M
17B	B	-	CA	B	B	CA/B	B	-	B	B	W	-	B
17C	M	-	W	M	M	M	-	M	M	M	M/F	M	M
17D	Z	Z	-	-	Z	1	Z	-	3	0	.2	1.5	0
17E	12.8	-	-	15	22.5	18	-	17.5	30	21	17.5	22.5	17
17F	25	-	150	300	130	202	-	650	80	100	50	35	30
17G	5	-	2	1.5	9	1	-	50	<5	3	<3	7.5	10
17H	2	2	1	1	1/2	1/2	1	1/1	1	2	-	0	1/1
17I	27.5	10	50	11	7.5	15	50	25	24	112	-	25	35
18	-	Y	Y	Y	Y	Y	Y	Y	-	-	-	Y	Y
19	-	Y	N	N	Y	Y	-	Y	-	-	-	N	N
20	-	N	N	N	Y	N	-	N	-	-	-	N	N

*UNIT OPERATES AS A FIXED STATION. DEPLOYMENTS ARE PRE FIXED STATION AVERAGES.

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSC-62

SHELTER TYPE S-424,423

QUESTION NUMBER	RESPONSE											
1	49	51	52	56	57	64						
2	2	2	1	1	1	3						
3	A	A	A	A	I	A						
4	0	0	0	0	0	0						
5	1	1	1	1	1	1						
6	1.5	.5	3	-	9	5						
7	1.5	9	1	5	2	4.5						
8	0	0	0	0	0	0						
9	0	0	0	0	0	0						
10	0	-	0	-	0	0						
11	0	0	0	0	0	0						
12	0	1	1	0	0	0						
13	0	1	0	0	1.5	0						
14	0	10	3.5	0	0	0						
14A	-	2	<1	-	-	-						
14B	-	2	<1	-	-	-						
15	365	200	260	280	300	200						
15A	4	6	8.5	12	9	4						
16	1	15	4	4	3	8						
17	0	10	2	4	3	8						
17A	-	M	M	M	M	M						
17B	-	B	B	B	B	B						
17C	-	M	M	M	M	M						
17D	-	4	Z	0	Z	Z						
17E	-	18	30	17	22	30						
17F	-	500	200	250	250	70						
17G	-	10	5	10	7	1						
17H	-	1/2	1/2	0	0	1/2						
17I	1	10	25	12.5	36	50						
18	Y	Y	Y	Y	Y	Y						
19	N	Y	Y	Y	Y	N						
20	N	Y	Y	N	N	N						

EQUIPMENT TYPE AN/TSC-88

QUESTION NUMBER	RESPONSE
1	4
2	1
3	1
4	0
5	1
6	-
7	1
8	0
9	0
10	0
11	0
12	0
13	0
14	0
14A	0
14B	0
15	-
15A	8
16	-
17	0
17A	-
17B	-
17C	-
17D	0
17E	0
17F	0
17G	0
17H	2
17I	10
18	Y
19	N
20	N

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/MSQ-10

SHELTER TYPE V-83, S-121

QUESTION NUMBER	RESPONSE											
1	7	60										
2	1	1										
3	1	1										
4	0	0										
5	1	1										
6	26	1.5										
7	5	20										
8	0	0										
9	0	0										
10	0	0										
11	0	0										
12	3	1.5										
13	0	-										
14	2	2.5										
14A	1	2										
14B	1	3										
15	50	3										
15A	8	10										
16	6	1.5										
17	5	3										
17A	T	T										
17B	B	B										
17C	W	-										
17D	-	2										
17E	-	11										
17F	150	250										
17G	2	27										
17H	1	1/2										
17I	50	20										
18	Y	Y										
19	N	N										
20	N	N										

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSQ-61

SHELTER TYPE S-388, 280

QUESTION NUMBER	RESPONSE												
1	11	18	19	31	34	35	37	41	43	44	45	46	48
2	1	1	1	1	1	1	1	1	1	1	1	1	1
3	I	I	A	A	A	A	I	I	I	A	A	A	A
4	0	0	0	I	I	I	Q	Q	Q	Q	Q	Q	Q
5	1	1	1	4	6	6	1	1	1	1	2	1	1
6	12	7	.75	1.6	2.2	1.6	10	13	30	1.3	1.5	2	.5
7	9	1	.5	13.7	2	12.5	5	4	1	5	4	4.6	1
8	0	0	0	1	0	0	0	0	0	1	0	1	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	1	0	1	1	1	2	0	1	0	1	1	1	2
11	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	1	4	0	5	1	0	0	6	1	2	4
13	3	0	2	10	10	0	0	0	0	0	1	14	3
14	2	0	0	4	10	5	0	1	0	16	5	6	4
14A	1	0	0	2	1	.2	0	.5	0	1.2	-	1	.5
14B	1	0	0	1	.5	.2	0	.5	0	6.3	-	1	.8
15	200	156	200	130	260	156	115	200	-	300	250	220	300
15A	4	6	8	8	8	10	8	7	-	9	-	8	10
16	1	2	6	6	10	5	2	2	1	16	5	7	4
17	1	2	6	4	10	5	1	1	1	16	5	6	4
17A	M	T	T	M	M	M	M	M	T	M	M	M	M
17B	-	CA	-	B	B	B	CH	B	-	B	B	B	W
17C	M	W	-	M	M	M	M	M	F/C	M	M	4	C/4
17D	Z	Z	Z	0	1	0	2	0	0	0	0	0	0
17E	15	15	7	4	4	5	15	15	15	7	14	6	5
17F	300	105	180	50	50	50	425	1300	0	350	50	30	59
17G	5.5	17.5	30	1	1	2.5	.25	2	0	21	5	3	7
17H	0	1/2	2	2	2.5	2	0	1	0	1/3	3	2/3	2
17I	6	3.5	30	8	80	40	5	10	4	50	25	80	75
18	Y	Y	Y	-	-	-	Y	Y	Y	Y	Y	Y	Y
19	Y	N	Y	-	-	-	N	N	N	Y	Y	N	Y
20	Y	N	N	-	-	-	N	N	N	N	N	N	Y

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSQ-61

SHELTER TYPE S-388,280

QUESTION NUMBER	RESPONSE												
1	50												
2	1												
3	A												
4	0												
5	.2												
6	.1												
7	.2												
8	0												
9	0												
10	0												
11	0												
12	0												
13	6												
14	-												
14A	-												
14B	-												
15	300												
15A	16												
16	3												
17	-												
17A	M												
17B	8												
17C	-												
17D	-												
17E	-												
17F	-												
17G	-												
17H	2/3												
17I	30												
18	Y												
19	Y												
20	N												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSQ-91

SHELTER TYPE

QUESTION NUMBER	RESPONSE											
1	20	36	39	47	56	63						
2	1	1	1	1	1	2						
3	I	A	I	A	A	A						
4	Q	I	I	Q	Q	Q						
5	1	8	2	1	1	1						
6	20	2.1	14	1.3	-	4						
7	9		8.5	3.5	5	-						
8	0	0	0	0	0	0						
9	0	0	0	0	0	-						
10	8	1	1	1	2	-						
11	0	0	0	0	0	0						
12	0	3.5	.25	.5	0	4						
13	2	10	1	5	4	5						
14	0	2	-	5	0	-						
14A	0	1.4	2	.5	0	-						
14B	0	2.1	2	.8	0	-						
15	216	365	-	300	280	300						
15A	7	24	-	16	12	8						
16	1.5	3	1	5	4	5						
17	1.5	1.5	1	5	4	5						
17A	M	M	M	M	M	M						
17B	-	8	-	8	8	8						
17C	M	M	F	M	M	F						
17D	2	0	.2	0	0	5						
17E	22.5	14	14	18	17	14						
17F	130	180	50	100	250	40						
17G	9	20	<3	2	10	10						
17H	8/10	2	10	2/2	3/4	10						
17I	15	420	-	25	20	20						
18	Y	-	-	Y	Y	-						
19	Y	-	-	Y	Y	-						
20	Y	-	-	N	N	-						

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE OA-8448/TSQ-92

SHELTER TYPE

QUESTION NUMBER	RESPONSE												
1	26												
2	2												
3	I												
4	0												
5	1												
6	4												
7	1.5												
8	0												
9	0												
10	1												
11	0												
12	0												
13	2.5												
14	2.5												
14A	.75												
14B	.75												
15	120												
15A	6												
16	1.5												
17	1.5												
17A	M												
17B	-												
17C	M												
17D	-												
17E	17.5												
17F	650												
17G	50												
17H	4/6												
17I	15												
18	Y												
19	N												
20	N												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSA-34/TSQ-92							SHELTER TYPE						
QUESTION NUMBER	RESPONSE												
1	26												
2	2												
3	I												
4	Q												
5	1												
6	4												
7	1.5												
8	0												
9	0												
10	1												
11	0												
12	0												
13	2.5												
14	2.5												
14A	.75												
14B	.75												
15	120												
15A	6												
16	1.5												
17	1.5												
17A	M												
17B	-												
17C	M												
17D	-												
17E	17.5												
17F	650												
17G	50												
17H	4/6												
17I	15												
18	Y												
19	N												
20	N												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSA-35/TSQ-92

SHELTER TYPE

QUESTION NUMBER	RESPONSE												
1	26												
2	1												
3	1												
4	0												
5	1												
6	4												
7	1.5												
8	0												
9	0												
10	-												
11	0												
12	0												
13	2.5												
14	2.5												
14A	.75												
14B	.75												
15	120												
15A	6												
16	1.5												
17	1.5												
17A	M												
17B	-												
17C	M												
17D	-												
17E	17.5												
17F	650												
17G	50												
17H	4/6												
17I	15												
18	Y												
19	N												
20	N												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSQ-93

SHELTER TYPE

QUESTION NUMBER	RESPONSE											
1	3	23	55									
2	1	1	1									
3	A	I	I									
4	I	Q	Q									
5	1	1	1									
6	.8	12	5									
7	2	9	9									
8	0	Z	0									
9	0	0	0									
10	0	1	1									
11	0	0	0									
12	0	0	0									
13	0	4	2.5									
14	0	4	0									
14A	0	<1	0									
14B	0	<1	0									
15	194	200	70									
15A	16	8	8									
16	12	2	3.5									
17	4.5	3	6									
17A	I	M	M									
17B	CA	CH	-									
17C	W	M	W									
17D	0	Z	-									
17E	4	16.5	15									
17F	15	202	200									
17G	20	9	3									
17H	2/2	2/4	3/4									
17I	288	30	20									
18	-	Y	Y									
19	-	Y	N									
20	-	N	N									

AD-A117 735 IIT RESEARCH INST CHICAGO IL
LEAST COST TEST PROFILE. VOLUME II.(U)
APR 82 J J STEINKIRCHNER

IIT RESEARCH INST CHICAGO IL
LEAST COST TEST PROFILE. VOLUME II. (U)
APR 82 J J STEINKIRCHNER

F/6 13/13

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F30602-80-C-0263
RADC-TR-82-84-VOL-2 NL

$$\frac{2}{3} \div \frac{4}{5}$$
$$\Delta \bar{S} = \Delta \bar{S}_1 + \Delta \bar{S}_2$$

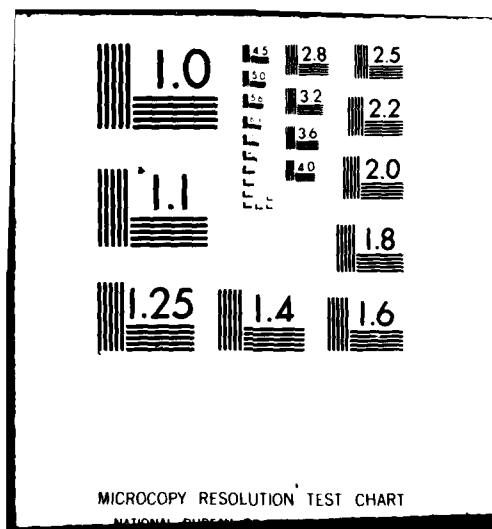


TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE 0A-8451/TSQ

SHELTER TYPE

QUESTION NUMBER	RESPONSE											
1	53											
2	1											
3	A											
4	0											
5	1											
6	3											
7	3											
8	0											
9	0											
10	1											
11	0											
12	0											
13	0											
14	3											
14A	.5											
14B	1											
15	130											
15A	6											
16	15											
17	3											
17A	T											
17B	CH											
17C	W											
17D	Z											
17E	12											
17F	350											
17G	17											
17H	1/2											
17I	15											
18	Y											
19	N											
20	N											

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE 0A-8452/TSQ

SHELTER TYPE

QUESTION NUMBER	RESPONSE												
1	53												
2	2												
3	A												
4	Q												
5	1												
6	3												
7	3												
8	0												
9	0												
10	2												
11	0												
12	0												
13	0												
14	3												
14A	.5												
14B	1												
15	130												
15A	6												
16	15												
17	3												
17A	T												
17B	CH												
17C	W												
17D	Z												
17E	12												
17F	350												
17G	17												
17H	1/2												
17I	10												
18	Y												
19	N												
20	N												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/GSQ-120

SHELTER TYPE S-542, 546

QUESTION NUMBER	RESPONSE									
1	11	20	36	39	47					
2	1	2	2	1	2					
3	I	I	A	I	A					
4	0	0	I	I	0					
5	1	1	8	2	1					
6	25	20	2.1	14	3.5					
7	1	1.5	2	2	1.5					
8	0	0	.14	0	0					
9	0	0	0	0	0					
10	0	0	0	0	0					
11	0	0	0	-	0					
12	0	0	0	-	2					
13	0	0	0	0	0					
14	1	0	0	-	2					
14A	.5	0	0	2	.5					
14B	1	0	0	2	1					
15	-	30	365	-	330					
15A	-	6	14	-	9					
16	1	1.5	3	-	2					
17	1	1.5	3	1	2					
17A	T	M	M/T	M	M					
17B	CA	-	B/CA	W	-					
17C	W	-	M/W	F/M	C/M					
17D	-	2	0	.2	0					
17E	15	1.5	21	14	35					
17F	300	8	100	50	100					
17G	1.5	0	3		10					
17H	1	0	2		1					
17I	12.5	8	14	-						
18	Y	Y	-	-	Y					
19	N	N	-	-	N					
20	N	N	-	-	N					

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TSW-7

SHELTER TYPE S-332

QUESTION NUMBER	RESPONSE												
1	2	30	60	64									
2	2	2	1	2									
3	A	A	I	A									
4	I	I	Q	Q									
5	1	1	1	1									
6	.25	5	1.5	5									
7	9	10	10	3.5									
8	0	0	0	0									
9	0	0	0	0									
10	2	0	0	1									
11	0	0	0	0									
12	0	0	3	0									
13	4	2	0	3									
14	2	2	3	3									
14A	1.5	2	1	.5									
14B	1	2	T	.5									
15	195	0	50	60									
15A	8	8	12	6									
16	-	0	10	3									
17	4	2	6	3									
17A	M	M	T	M									
17B	B	8	W	8									
17C	M	M	F	M									
17D	1	1	1	Z									
17E	12.8	180	8.5	30									
17F	25	80	250	70									
17G	.5	<5	27	1									
17H	2/2	1	1/2	1/2									
17I	27.5	24	3	50									
18	-	-	Y	Y									
19	-	-	N	N									
20	-	-	N	N									

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/MTC-2

SHELTER TYPE MC-2

QUESTION NUMBER	RESPONSE											
1	5											
2	1											
3	I											
4	Q											
5	1											
6	24											
7	11											
8	0											
9	0											
10	0											
11	0											
12	0											
13	0											
14	1											
14A	<1											
14B	<1											
15	60											
15A	6											
16	3											
17	2.5											
17A	T											
17B	CA											
17C	F											
17D	Z											
17E	15											
17F	700											
17G	30											
17H	0											
17I	30											
18	Y											
19	N											
20	N											

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TTC-7

SHELTER TYPE M119, FM-31

QUESTION NUMBER	RESPONSE										
1	15	65									
2	1	1									
3	I	I									
4	Q	Q									
5	1	1									
6	17	9									
7	17	-									
8	0	0									
9	Z	0									
10	0	0									
11	0	0									
12	2	1.5									
13	0	0									
14	0	1.5									
14A	0	1									
14B	0	2.5									
15	12	24									
15A	6	8									
16	12	1									
17	4	1.5									
17A	T	T									
17B	-	CA/CH									
17C	-	C									
17D	Z	Z									
17E	15	8.5									
17F	505	255									
17G	0	11									
17H	1	0									
17I	20	15									
18	Y	Y									
19	Y	N									
20	Y	N									

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TTC-22

SHELTER TYPE S-362, V-367

QUESTION NUMBER	RESPONSE												
1	16	42	60	64									
2	1	1	1	2									
3	I	I	I	A									
4	Q	Q	Q	Q									
5	1	1	1	1									
6	4	10	1.5	5									
7	10	9	7	4									
8	0	0	0	3									
9	0	0	0	0									
10	1	0	0	0									
11	0	0	1	0									
12	0	0	3	0									
13	0	0	0	0									
14	0	5	3	2									
14A	0	1	1.5	.5									
14B	0	1	1.5	.5									
15	12	32	24	200									
15A	7	8	10	8									
16	1	5	4.5	4									
17	3	5	4.5	4									
17A	-	T	T/M	M									
17B	-	-	W/B	B									
17C	-	-	F	M									
17D	.8	1.5	Z	Z									
17E	30	22.5	16	15									
17F	15	35	350	140									
17G	0	7.5	27	2									
17H	1/2	0	1/2	1/2									
17I	10	25	20	20									
18	Y	Y	Y	Y									
19	N	N	Y	N									
20	N	N	Y	Y									

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TTC-28

SHELTER TYPE

QUESTION NUMBER	RESPONSE												
1	51												
2	4												
3	A												
4	Q												
5	1												
6	3.5												
7	10												
8	0												
9	0												
10	-												
11	1												
12	-												
13	-												
14	4												
14A	1												
14B	1												
15	170												
15A	8												
16	15												
17	4												
17A	M												
17B	B												
17C	M												
17D	Z												
17E	17												
17F	1600												
17G	20												
17H	2												
17I	30												
18	Y												
19	-												
20	-												

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TTC-30						SHELTER TYPE							
QUESTION NUMBER	RESPONSE												
1	20	26	30	36	39	47	49	56	63	64			
2	1	1	1	2	1	1	1	1	1	1			
3	I	I	A	A	I	A	A	A	A	A			
4	0	0	1	1	1	0	0	0	0	0			
5	1	1	1	8	2	1	1	1	1	1			
6	20	4	.5	2.1	14	1.5	1.5	-	4	5			
7	10	1.5	8	5	8.5	1.2	1.5	5	-	3			
8	0	0	0	0	0	0	0	0	0	0			
9	0	0	0	0	0	0	0	0	-	0			
10	0	0	0	2	0	1	-	0	-	1			
11	0	1	0	0	0	0	0	0	0	0			
12	0	0	0	<1	.25	0	0	0	4	0			
13	2	2.5	3	10	1	4	1	0	5	10			
14	0	2.5	3	10	1	4	0	0	-	5			
14A	0	.75	2	1.4	2	.5	0	0	-	.5			
14B	0	.75	2	2.1	2	.5	0	0	-	.5			
15	100	55	100	365	-	300	365	280	300	180			
15A	7	7	8	24	-	12	6	12	8	3			
16	1.5	1.5	4	<1	1	4	1	4	5	5			
17	1.5	1.5	4	1.5	1	4	0	4	5	5			
17A	M	M	M	M	M	M	-	M	M	M			
17B	-	-	B	B	W	B	-	B	B	B			
17C	M	M	M	W	F	-	-	M	F	M			
17D	Z	-	2	0	.2	0	0	0	5	Z			
17E	22.5	17.5	20	17.5	14	17	0	17	14	30			
17F	130	650	80	180	50	100	0	250	40	70			
17G	9	50	<5	20	<3	5	0	10	10	2			
17H	0	1/2	1	2	-	2	-	0	4	1/2			
17I	12.5	15	24	48	-	25	10	9	20	30			
18	Y	Y	-	-	-	Y	Y	Y	-	Y			
19	N	Y	-	-	-	N	N	Y	-	N			
20	N	Y	-	-	-	N	N	Y	-	N			

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TYC-8

M373A2E7
SHELTER TYPE M373A2E6

QUESTION NUMBER	RESPONSE									
	2	5	15	16	51	64	65			
1										
2	1	2	1	1	8	2	1			
3	A	I	I	I	A	A	I			
4	I	0	0	0	0	0	0			
5	1	1	1	1	1	1	1			
6	2	8	17	6.5	-	5	9			
7	10	8	8	8	3.5	5	8			
8	0	0	0	0	0	0	0			
9	0	0	0	-	.3	0	0			
10	2	0	0	0	0	0	0			
11	1	0	0	0	1	0	0			
12	0	0	0	0	0	0	0			
13	5	0	6	0	0	0	0			
14	4.5	2	0	0	2.5	0	0			
14A	1	<1	0	0	1	0	0			
14B	2	<2	0	0	2	0	0			
15	90	30	4	363	221	200	18			
15A	8	8	6	1	10	5	8			
16	5	2	4	2	13.5	10	1			
17	2	2	4	1	3.5	2.5	0			
17A	M	T	T	T	T	T	-			
17B	B	B	B	B	CA	B	-			
17C	C/F	-	-	-	C/F	M	-			
17D	1	Z	Z	-	0	Z	0			
17E	21	8.5	30	1	30	5	0			
17F	70	600	505	5	600	70	0			
17G	2	10	0	.5	10	5	0			
17H	1/3	1	2	1	2	1/2	3			
17I	108	20	10	8	30	30	100			
18	-	Y	Y	Y	Y	Y	Y			
19	-	N	N	N	Y	N	N			
20	-	N	N	N	Y	Y	N			

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE AN/TYC-10

SHELTER TYPE

QUESTION NUMBER	RESPONSE												
1	1	47	49	62									
2	1/3	1	1	1									
3	A	A	A	A									
4	I	Q	Q	Q									
5	1	1	1	1									
6	1	1.3	1.5	1.3									
7	1.5	2	1.5	1.5									
8	0	0	0	0									
9	0	0	0	0									
10	0	0	0	0									
11	0	0	0	0									
12	0	.5	1	0									
13	1	5	4	1									
14	0	5	0	0									
14A	0	.5	0	0									
14B	0	.8	0	0									
15	130	300	200	40									
15A	3	20	6	4									
16	0	5	4	1									
17	0	5	1	0									
17A	0	M	M	-									
17B	-	B	B	-									
17C	-	M	M	-									
17D	0	Z	0	0									
17E	0	18	46	0									
17F	0	100	50	0									
17G	0	2	10	0									
17H	1/1	2/2	-	0									
17I	6	13	20	-									
18	-	Y	Y	Y									
19	-	N	N	Y									
20	-	N	N	Y									

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE S-138TR

SHELTER TYPE S-138TR

QUESTION NUMBER	RESPONSE												
1	23												
2	1												
3	I												
4	0												
5	1												
6	12												
7	9												
8	Z												
9	0												
10	0												
11	0												
12	0												
13	0												
14	4												
14A	<1												
14B	<1												
15	260												
15A	24												
16	3												
17	3												
17A	T												
17B	CA/CH												
17C	W												
17D	Z												
17E	16.5												
17F	202												
17G	9												
17H	1												
17I	30												
18	N												
19	N												
20	N												

EQUIPMENT TYPE S-141

[illegible]

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE S-280

SHELTER TYPE S-280

QUESTION NUMBER	RESPONSE												
1	3	9	11	17	20	26	31	34	35	36	37	39	41
2	1	3	2	3	6	4	3	4	5	3	1	5	1
3	A	I	I	I	I	I	A	A	A	A	I	I	I
4	I	0	Q	0	0	0	I	I	I	I	Q	I	Q
5	1	1	1	1	1	1	5	6	6	8	1	2	1
6	.8	10	12	7.5	20	4	1.6	2.2	1.6	2.1	10	14	13
7	3	3.6	8	1.5	5	3.5	<3	-	-	-	3	-	3
8	0	0	0	0	0	0	0	0	1	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	-	0	0	0	-	-	-	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	4	0	5	3.5	1	-	0
13	0	0	0	0	0	0	0	0	0	10	0	0	0
14	-	1	0	4	0	2.5	4	-	5	2	0	-	0
14A	-	1	1	2	0	.75	2	-	.3	1.4	0	2	0
14B	-	2	1	2	0	.7	1	-	.3	2.1	0	2	0
15	52	246	365	50	-	75	10	195	156	365	360	-	30
15A	<1	24	0	8	-	7	8	6	10	24	24	-	6
16	-	1	1	4	1.5	1.5	6	-	5	3	2	-	1
17	9	1.5	0	4	1.5	1.5	4	3	5	1.5	1	1	1
17A	T	M/T	-	T	T	T	T	T	T	T	T	T	T
17B	CA	CH	-	-	CH	CH/CA	CA	CA	CA	CA	CH	-	W
17C	W	4/F	C	-	W	-	W	W	W	W	W	F	W
17D	0	1	0	-	Z	-	0	0	0	0	1	.2	0
17E	4	17.5	0	15	22.5	17.5	4	3	5	17.5	15	14	15
17F	15	400	0	505	130	650	50	30	50	180	-	50	50
17G	20	15	0	26.5	9	50	1	5	2.5	20	-	<3	10
17H	1/2	2	0	0	0	1/1	2	2	2	2	0	-	1
17I	3.5	33	1	30	7.5	15	38.7	15	200	360	2	-	2
18	-	Y	Y	Y	Y	Y	-	-	-	-	Y	-	Y
19	-	N	N	N	N	N	-	-	-	-	N	-	N
20	-	Y	N	N	N	N	-	-	-	-	N	-	N

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE S-280

SHELTER TYPE S-280

QUESTION NUMBER	RESPONSE													
1	44	45	46	48	49	50	51	52	57	63				
2	2	3	3	12	4	1	1	7	6	-				
3	A	A	A	A	A	A	A	A	A	A				
4	Q	Q	Q	Q	Q	Q	Q	Q	I	Q				
5	1	2	2	1	1	1	1	1	1	-				
6	1.3	1.5	2	.5	1.5	.1	2.5	3	9	-				
7	3	4	-	1	1.5	.2	6	-	8	-				
8	2	0	1	0	0	0	0	0	0	-				
9	0	0	0	0	0	0	0	0	0	-				
10	0	0	-	0	0	0	0	0	0	-				
11	2	0	0	0	0	0	-	0	0	-				
12	4	0	2	4	0	0	3	0	1.5	-				
13	0	Q	0	3	0	0	0	0	1.5	3				
14	6	5	6	4	0	-	0	0	0	0				
14A	1.4	-	1	.5	0	-	0	0	0	0				
14B	6.3	-	1	.8	0	-	0	0	0	0				
15	300	15	135	300	365	300	90	0	140	-				
15A	8	-	2	10	24	16	6	0	9	-				
16	6	5	7	4	1	3	6	-	3	-				
17	7	5	6	4	0	-	6	8	3	-				
17A	T	M	T	M	-	M	M/T	M	T	T				
17B	CH	B	-	M	-	B/CH	CA/CH	B	CH	-				
17C	-	M	4	C/4	-	-	F	M	M	-				
17D	0	0	0	0	0	-	3	Z	Z	-				
17E	7	14	6	5	0	-	30	30	15	-				
17F	140	100	30	59	0	-	1250	2000	130	-				
17G	20	100	3	7	0	-	25	4	7	-				
17H	1/3	2	1/2	2	-	-	0	1/1	-	2				
17I	15	25	21	100	10	30	10	50	30	50				
18	Y	Y	Y	Y	Y	Y	Y	Y	Y	N				
19	N	N	N	N	N	N	N	Y	-	Y				
20	N	N	N	N	N	N	N	N	N	Y				

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE S-517

SHELTER TYPE S-517

QUESTION NUMBER	RESPONSE												
1	22	24	30	51									
2	4	2	2	4									
3	I	I	A	A									
4	0	0	I	0									
5	1	1	1	1									
6	24	-	1.5	2									
7	6	6.5	8	7									
8	0	0	0	0									
9	0	0	0	0									
10	0	0	0	0									
11	0	0	0	0									
12	0	0	0	0									
13	2	1	3	4									
14	1	0	3	4									
14A	.5	0	2	1.5									
14B	.5	0	2	1.5									
15	200	6	90	30									
15A	6	10	8	4									
16	2	1	2	5									
17	2	1	3	6									
17A	M	M	M	M									
17B	CA/B	B	B	-									
17C	M	-	M	-									
17D	-	-	1.5	-									
17E	18	-	30	17									
17F	202	-	80	378									
17G	1	-	<5	8									
17H	1/4	4	3	4									
17I	4	-	24	40									
18	Y	Y	-	Y									
19	N	Y	-	Y									
20	N	Y	-	Y									

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE S-530							SHELTER TYPE S-530						
QUESTION NUMBER	RESPONSE												
1	1	3	9	11	14	18	19	23	26	31	34	36	
2	2	2	-	1	1	1	-	1	3	2	2	6	
3	A	A	I	I	A	I	A	I	I	A	A	A	
4	I	I	Q	Q	I	Q	Q	Q	Q	I	I	I	
5	1	1	1	1	1	1	1	1	1	4	6	4	
6	1	.8	10	12	8	7	.75	12	4	1.5	2.2	2.1	
7	.7	.5	.5	1	1.5	1	1	1	1	1	1	1	
8	0	0	0	0	0	0	0	2	0	0	0	0	
9	0	0	0	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	0	0	0	0	0	
11	0	0	0	0	-	0	0	0	0	0	0	0	
12	0	0	0	0	1.5	0	1	0	0	4	0	3	
13	1	2	0	1	1.5	0	2	0	4.5	2	10	7	
14	<1	0	1	1	1.5	0	0	4	2.5	4	10	7	
14A	0	0	1	1	2	0	0	<1	.75	2	1	1	
14B	1	0	2	1	2	2	0	<1	.75	1	.5	.8	
15	260	260	350	150	180	156	200	75	120	130	260	365	
15A	8.5	8	24	2	5	6	8	8	7	8	8	24	
16	0	0	1	1	6.5	2	6	2	2.5	6	10	2	
17	0	0	1.5	1	3.5	2	6	3	1.5	4	10	7	
17A	-	-	T	M	M	M	T	M	M	M	M	M	
17B	-	-	CH	-	8	8	-	CH	8	8	8	8	
17C	-	-	4/F	M	-	M	-	M	M	M	M	W/ M	
17D	0	0	1	Z	-	Z	Z	Z	-	0	1	0	
17E	0	0	17.5	15	10.5	15	7	16.5	17.5	4	4	17.5	
17F	0	0	400	300	10	105	180	202	650	50	50	180	
17G	0	0	15	5.5	10	17.5	30	9	50	1	1	20	
17H	1/1	2/2	2	2	1	1/2	2	1	1/1	2	2/3	2/3	
17I	17	48	27.5	4	50	12.5	20	20	7.5	64	160	12	
18	-	-	Y	Y	-	Y	Y	Y	Y	-	-	-	
19	-	-	Y	N	-	N	Y	N	Y	-	-	-	
20	-	-	Y	Y	-	N	Y	N	Y	-	-	-	

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE S-530

SHELTER TYPE S-530

QUESTION NUMBER	RESPONSE												
1	37	38	39	41	43	20	44	45	46	47	48	49	50
2	1	1	4	1	1	4	2	2	2	2	8	3	2
3	I	I	I	I	I	I	A	A	A	A	A	A	A
4	Q	Q	I	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
5	1	1	2	1	1	1	1	2	1	1	1	1	1
6	6	22	-	13	30	20	1.3	1.5	2	.2	.5	1.8	.1
7	1	1	1	1	1	1	1	1	1	1	1	1.2	.1
8	0	0	-	0	0	0	1	0	1	0	0	0	0
9	0	0	-	0	0	0	0	0	0	0	0	0	0
10	-	0	-	0	0	0	0	0	0	0	0	0	0
11	0	0	-	0	0	0	0	0	0	0	0	0	0
12	1	0	.25	0	0	0	6	0	2	0	4	1	0
13	0	0	-	0	2	0	0	1	1	4	3	4	-
14	1	1	-	1	0	0	16	5	6	0	4	0	-
14A	1	.5	3	.5	0	0	1.4	-	1	0	.5	0	-
14B	1	1	2	1	0	0	6.3	-	1	0	.8	0	-
15	125	30	-	180	40	-	300	240	220	330	300	150	300
15A	8	6	-	6	6	-	9	-	5	12	10	6	16
16	2	2	-	1	1	1.5	16	5	7	2	4	4	-
17	1	2	1	0	1	1.5	7	5	6	2	4	1	-
17A	M	M	M	M	M	M	M	M	M	M	M	M	M
17B	B	B	W	B	-	-	B	B	B	B	W	B	B
17C	M	M	F	M	F/C		M	M	4	M	C/4	M	M
17D	0	-	.2	0	0	Z	0	0	0	0	0	0	-
17E	15	23.5	17.5	0	15	22.5	7	14	6	30	5	46	0
17F	500	1850	50	0	0	130	350	100	30	1000	59	50	-
17G	2	15	3	0	0	9	20	100	3	50	7	10	-
17H	0	0/1	-	1	0	0	1/3	3	1/2	1	2	-	0
17I	10	15.5	-	2	4	7.5	20	25	40	20	25	25	30
18	Y	Y	-	Y	N	Y	Y	Y	Y	Y	N	Y	Y
19	N	N	-	N	N	N	Y	N	Y	N	N	Y	N
20	N	Y	-	N	N	N	N	N	Y	N	N	Y	Y

TABLE
QUESTIONNAIRE SUMMARY FORM

EQUIPMENT TYPE S-530

SHELTER TYPE S-530

QUESTION NUMBER	RESPONSE									
1	51	52	57	62	63					
2	2	3	3	2	1					
3	A	A	I	A	A					
4	Q	Q	Q	Q	Q					
5	1	1	1	1	1					
6	.5	3	9	1.3	1.5					
7	-	1	1.5	-	-					
8	0	0	0	0	-					
9	0	0	0	0	-					
10	0	0	0	0	-					
11	0	0	0	0	-					
12	0	0	0	0	-					
13	0	0	3	1	2					
14	0	3	0	0	-					
14A	0	1	0	0	-					
14B	0	1	0	0	-					
15	0	-	300	40	-					
15A	0	-	9	4	-					
16	0	12	3	1	-					
17	0	3	3	0	-					
17A	-	M	M	-	M					
17B	-	B	-	-	-					
17C	-	M	-	-	-					
17D	0	Z	Z	0	-					
17E	0	30	30	0	-					
17F	0	-	130	0	-					
17G	0	-	7	0	-					
17H	0	1/1	0	0	5					
17I	0	5	30	-	30					
18	-	Y	Y	Y	Y					
19	-	N	N	Y	N					
20	-	N	N	Y	N					

Appendix D
USER QUESTIONNAIRE
COMMENTS

UNIT IDENTIFICATIONS

IDENT NO.	UNIT	TYPE	LOCATION
1	5TH TAIRGG	AF	OSAN, KOREA
2	1961 COMM GP	AF	CLARK AB, PHILIPPINES
3	604TH DASS	AF	CAMP RED CLOUD, KOREA
4	239CCF/241ATCF	ANG	BRIDGETON, MO
5	223RD CMBT COMMSQ	ANG	HOT SPRINGS, AR
6	224TH CMBT COMMSQ	ANG	ST SIMONS ISLAND, GA
7	244TH CMBT COMM FLT	ANG	PORTLAND, OR
8	128TH TCF	ANG	MILWAUKEE, WI
9	104TH TCF	ANG	KLAMATH FALLS, OR
10	263RD CMBT COMM SQ	ANG	BADIN, NC
11	129TH TCS	ANG	KENNESAW, GA
12	282ND CMBTCS	ANG	COVENTRY, RI
13	113TH TCF	ANG	SYRACUSE, NY
14	75TH TCF	AF	ELGIN AFB, FL
15	222ND CMBT COMM SQ	ANG	COSTA MESA, CA
16	264TH CMBT COMM SQ	ANG	CHICAGO, IL
17	261ST CMBTCS	ANG	VAN NUYS, CA
18	138TH TCF	ANG	GREELEY, CO
19	71ST TCF	AF	MC DILL AFB, FL
20	103RD TCS	ANG	ORANGE, CT
21	265TH CMBTCS	ANG	PORTLAND, ME
22	226TH CMBTCS	ANG	GADSDEN, AL
23	111 CEM SQ	ANG	WILLOW GROVE, PA
24	267TH CMBTCS	ANG	WELLESLEY, MA
25	12TH TRS	AF	BERGSTROM AFB, TX
26	105TH TCS	ANG	CHENEY, WA
27	91ST TRS/DOTP	AF	BERGSTROM AFB, TX
28	1ST TRS/10TH TRW	AF	ALCONBURY, ENGLAND
29	10TH RTS	AF	ALCONBURY, ENGLAND
30	1ST CMBTCS	AF	LINDSEY AS, GERMANY
31	621ST TCF	AF	WIESBADEN AFB, GERMANY
32	38TH TRS/38TH TRW	AF	ZWEIBRUKEN AFB, GERMANY
33	26TH TRW	AF	ZWEIBRUKEN AFB, GERMANY
34	611TH TCF	AF	ALZEY, GERMANY
35	622ND TCF	AF	RHEIN GRAFENSTEIN, GERMANY
36	603RD TCS	AF	ALZEY, GERMANY
37	124TH TCF	ANG	CINCINNATI, OHIO
38	123RD TCF	ANG	CINCINNATI, OHIO
39	101ST TCS	ANG	WORCHESTER, MA
40	6906 ESS	AF	BROOKS AFB, TX
41	157 TCF	ANG	JEFFERSON BARRACKS, MO
42	256 CMBTCS (AFCH)	ANG	TACOMA, WA
43	112TH TCF	ANG	UNIVERSITY PARK, PA
44	629TH TCF	AF	SCHWELENTROP, GERMANY
45	626TH TCF	AF	NORDHOLZ, GERMANY
46	619TH TCF	AF	SCHWELENTROP, GERMANY

UNIT IDENTIFICATIONS

IDENT NO.	UNIT	TYPE	LOCATION
47	606TH TCS	AF	BREMERHAVEN, GERMANY
48	636TH TCF	AF	NORDHOLZ, GERMANY
49	727TH TCS	AF	EGLIN AFB, FL
50	81ST TCF	AF	KADENA AB, JAPAN
51	3RD CMBTCG	AF	TINKER AFB, OK
52	507TH TACCS	AF	SHAW AFB, SC
53	682ND ASOC	AF	SHAW AFB, SC
54	6948TH ESC	AF	SAN ANTONIO, TX
55	105TH CEM	ANG	WHITE PLAINS, NY
56	609TH TCS	AF	HESSISCH-OLDENDORF, GERMANY
57	107TH TCS	ANG	PHOENIX, AZ
58	244TH CMBTCS	ANG	PORTLAND, OR
59	6922ND ESS	AF	CLARK AB, PHILIPPINES
60	234TH CMBTCS	ANG	HAYWARD, CA
61	6911 ESG	AF	HAHN AB, GERMANY
62	621ST TCS	AF	OSAN, KOREA
	6130TH TCF	AF	OSAN, KOREA
	6140TH TCF	AF	OSAN, KOREA
63	728TH TCS	AF	DUKE FIELD, FL
64	2ND CMBTCG	AF	PATRICK AFB, FL
65	271ST CMBTCS	ANG	ANNVILLE, PA

TABLE
ALL EQUIPMENTS
GENERAL COMMENTS

IDENT NO.	GENERAL COMMENT
1	A) USE PLYWOOD SUPPORT ON ROOF BEFORE ANYONE ALLOWED ON IT. B) NEVER SEEN A FIRE IN A SHELTER. C) MAY HAVE TO FORD THE SHELTERS TO MEET TACTICAL COMMITMENTS. WOULD APPLY TO MOBILIZER EQUIPMENT NOT TO MUCH TO 2 1/2 TON MOUNTED. D) SHELTERS SENT TO McCLELLAN FOR RENOVATION. E) 407L LOADING KIT NOT ADEQUATE. F) UNITS SHOULD HAVE AN ADAPTER KIT SO THAT THEY CAN USE A WRECKER TO LOAD/UNLOAD SHELTER WITHOUT CAUSING DAMAGE. THEY HAVE NOT EXPERIENCED ANY APPARENT DAMAGE SO FAR BUT ARE AWARE THAT IT COULD OCCUR. G) DON'T BACKUP SHELTER ON MOBILIZER BECAUSE THEY HAVE HEARD OF PROBLEMS (GROUP POLICY).
2	A) NO FIRE IN SHELTER. B) THEY ARE CURRENTLY DEPLOYED IN KOREA. THEY WERE DEPLOYED BY SHIP. C) NEVER SAW SHELTER DEPLOYED BY HELICOPTOR. D) DON'T BACKUP SHELTER ON MOBILIZER. E) WHEN LIFTED BY SLING WITH MOBILIZER ATTACHED, THE MOBILIZER AIR BAGS AND HYDRAULIC LIFT SEALS ARE DAMAGED. F) McCLELLAN IS THE DEPOT.
3	A) NO FIRES SEEN IN SHELTER. B) NEVER SEEN A SHELTER BACKED UP ON A MOBILIZER. C) THEY LOAD/UNLOAD A SHELTER AN AVERAGE OF 2/3 TIMES A YEAR WITH WRECKER. USUALLY WRECKER USED WITHOUT A SPREADER KIT. D) THEY ARE ON 5 YEAR DEPOT CYCLE. E) IF DEPLOYED BY AIR THEN MUST PUT ON MOBILIZERS BEFORE DEPLOYMENT. THEY DON'T DEPLOY BY AIR.
9	A) SURVIVABILITY: FRAGMENT PENETRATION.

TABLE
ALL EQUIPMENTS
GENERAL COMMENTS

IDENT NO.	GENERAL COMMENT
12	A) WHEN USING LIFTING/TIE DOWN ASSEMBLY, STRESS ON SUPERSTRUCTURE?
15	<p>A) THIS STATION WAS CONSTRUCTED IN 1964, TWO OTHER TEMPORARY LOCATIONS WERE USED PRIOR TO 1964, UNIT ORIGINALLY ESTABLISHED WITH MOST OF THIS EQUIPMENT IN 1956.</p> <p>B) SOME EQUIPMENT IS REQUIRED TO BE OPERATED ON INACCESSABLE MOUNTAIN TOPS, HELICOPTERS ARE USED TO AIR LIFT BY SLING. IN THESE INSTANCES, NO VANS ARE EVER PARACHUTED.</p> <p>C) SOME EQUIPMENT IS NEVER REQUIRED TO BE OPERATED AT MOUNTAIN TOP LOCATIONS AND IS GENERALLY OPERATED FROM ASPHALT PARKING AREAS. OTHERS ARE NEVER OPERATED ON PAVED SURFACES.</p> <p>D) THIS SQUADRON IS AN ANG UNIT WHICH DRILLS ONE WEEK AND PER MONTH AND PERFORMS TASKINGS FOR TWO WEEK FIELD TRAINING PERIODS, JCS EXERCISES AND ARMY SUPPORT ENCAMPMENTS PER YEAR.</p> <p>E) BUDGET CONSTRAINTS, TIME FRAMES, AVAILABILITY OF AIRCRAFT DETERMINES METHODS OF TRANSPORT. WE HAVE USED AIR LIFT, SEA LIFT, TRAINS AND CONVOY TO TRANSPORT ASSIGNED ITEMS TO EXERCISE AREA.</p> <p>F) DEPLOYMENT PERIODS VARY PER EXERCISE AND ALSO THE AMOUNT OF EXERCISE TASKINGS WE ARE COMMITTED TO EACH YEAR VARIES.</p> <p>G) WE HAVE A WIDE VARIETY OF LOCATIONS AS TASKED. THESE AREAS RANGE FROM WINTER COLD TO SUMMER HOT, HUMIDITY VARIES FROM LOW TO HIGH, ALTITUDE VARIES BETWEEN SEA LEVEL AND 9000 FT, LOCATION RANGES FROM CONUS TO OVERSEAS. EQUIPMENT HAS BEEN OPERATED IN DESERT, IN MOUNTAINS, IN POPULATED AREAS, HIGH WINDS, ETC.</p>
16	A) HISTORICAL RECORDS HAD NO SIGNIFICANT SHELTER DATA.
17	A) ALL SHELTERS TRANSPORTED ON MOBILIZERS. ONR OR TWO PERSONS WOULD BE ON SHELTER ROOF TO ROUTE BRAKE HOSES AND ELECTRICAL CABLES EACH TIME DOLLY SET IS INSTALLED/REMOVED.

TABLE
ALL EQUIPMENTS
GENERAL COMMENTS

IDENT NO.	GENERAL COMMENT
26	B) NORMAL AREAS OF DEPLOYMENT RANGE FROM SEMIARID AREAS OF SOUTHERN IDAHO AND CENTRAL WASHINGTON TO VERY WET/RAINY AREAS OF THE OREGON AND WASHINGTON COASTS. OUR SHELTERS ARE SUBJECTED TO TEMPERATURE RANGES FROM -30°F TO + 100°F.
30	ONE RESPONDENT STATED THAT SOME SHELTERS WERE SHIPPED IN BY TRAIN FROM BERMERHAVEN, BUT IT WAS AWHILE AGO. THEY CURRENTLY DO NOT DEPLOY BY TRAIN.
31	A) SHELTERS SHOULD BE CAMOUFLAGE PAINTED AT DEPOT OR FACTORY. B) THEY BELIEVE THAT ROOF SHOULD BY STRENGTHENED.
33	A) THESE EQUIPMENTS ARE PREDEPLOYED AND IN A READY STATE. THEY ARE ARE NOT USUALLY OPERATED. B) THE VANS ARE LOCATED INSIDE A BUILDING. C) ON WARTIME BASIS THESE VANS WOULD BE USED ON 24 HOUR BASIS. D) DRY SHELTER EXPANDABLES HAVE CEILING DELAMINATIONS. WET SHELTERS USUALLY GET FLOOR DELAMINATIONS. E) ONLY REASON TO SEND SHELTER BACK TO DEPOT IS FOR DELAMINATION.
34	A) NEVER FORD. B) NEVER SEEN SHELTER ON A TRAIN
35	A) DOOR LATCHES DIFFICULT TO OPERATE. B) SHELTERS SHOULD BE DESIGNED TO HELILIFT WITH MOBILIZERS ATTACHED.
36	A) THIS UNIT HAS BEEN OPERATING AS A FIXED STATION FOR 1 1/2 YEARS OPERATING 24 HRS/DAY. PROSPECTS ARE THAT WILL CONTINUE FOR 1-2 YEARS. DEPLOYMENT DATA IS FOR PRE-FIXED STATION STATUS AT 14 HRS/DAY OPERATION.
15	A) DOES NOT LIST THE TSC-60 BEING MOBILIZED BY TRUCK; HOWEVER LISTS REASON FOR PERSONNEL ON ROOF AS ATTACHING HOIST CABLES WHEN SHELTER IS "SLINGED" ONTO OR FROM A M35A2 CARGO VEHICLE.

TABLE
ALL EQUIPMENTS
GENERAL COMMENTS

GENERAL COMMENT

-
- 25 A) SHELTERS ARE ALWAYS ON JACKS, EXCEPT DURING ACTUAL MOBILITY EXERCISES.
 B) PERSONNEL MAY GO ON THE ROOF OF SHELTERS FOR CORROSION CONTROL, OR TO RESEAL WEATHER FLAPS ON HINGES.
 C) ROOFS ARE INCLUDED IN PERIODIC INSPECTIONS.
 D) MAJOR CONCERNS INCLUDE PROPER CLEANING OF SHELTERS (IN THE PHOTO-CHEMICAL ENVIRONMENT THEY'RE IN), PROPER MAINTENANCE OF EQUIPMENT WITHIN SHELTERS, AND PROPER CORROSION CONTROL TO EQUIPMENT AND SHELTERS THEMSELVES.
 E) MOBILIZE 4-5 TIMES YEARLY.
- 32 A) SHELTERS MOVED ON JACKS TO ALIGN DURING SETUP.
 B) SOME SHELTERS USED CONTINUOUSLY, SOME ONLY FOR SPARES. ALL TYPES.
 C) TRUCKS USED TO SEND SHELTERS TO DEPOT.
- 33 A) 18 FS-6 SHELTERS SENT TO DEPOT SINCE 1974.
 10 FS-7 " " " " " "
 11 ES-57 " " " " " "
 8 ES-58 " " " " " "
 40 ES-59 " " " " " "
 2 ES-60 " " " " " "
 6 ES-61 " " " " " "
 11 ES-63 " " " " " "
 8 ES-64 " " " " " "
 6 ES-65 " " " " " "
 7 ES-72 " " " " " "
 4 ES-73 " " " " " "
 3 FM-177 " " " " " "

TABLE
ALL EQUIPMENTS
GENERAL COMMENTS

IDENT NO.	GENERAL COMMENT
39	<p>A) THE TWO RESPONDENTS HAVE SEEN 5 SHELTERS DROPPED. ONE RESPONDENT SAW 2 IN 20 YEARS, THE OTHER 3 IN 8 YEARS. REASONS GIVEN FOR DROP WAS CHAIN BROKE AND SLING STRETCH. SHELTER/EQUIPMENT TYPE UNKNOWN.</p> <p>B) SAW ONE SHELTER MOBILIZED BY A HELICOPTER AT EGLIN AFB. SHELTER TYPE UNKNOWN. BELIEVE IT WAS A TEST.</p> <p>C) SAW ONE SHELTER ON A RAILROAD CAR IN 1969 AT EGLIN AFB DURING A DEMONSTRATION TEST. SHELTER TYPE UNKNOWN.</p> <p>D) NEVER SAW A SHELTER FORDED.</p> <p>E) EQUIPMENTS ARE WASHED BEFORE AND AFTER A DEPLOYMENT.</p> <p>F) THEY HAVE NEVER DEPLOYED IN WINTER BUT HAVE PREPARED FOR IT.</p> <p>G) ANY NEW INFLATABLE SHOULD EXTEND OVER THE SHELTER ALSO.</p> <p>H) THEY PULL PM FOR CORROSION, LUBRICATION, DOOR SEALS, PATCH HOLES, AND DOOR HANDLES.</p> <p>I) THERE EQUIPMENT IS USUALLY SETUP ON BASE BUT DURATION IS UNKNOWN.</p> <p>J) THEY REPORTED THAT SHELTERS ARE BACKED UP ON MOBILIZERS AND THAT THEY HAD ONE SHEAR PIN BREAK.</p> <p>K) THEY REPORTED THAT THE ECU'S ARE ADEQUATE.</p>
42	<p>A) THE MILES INDICATED ARE INDICATIVE OF LOCAL DEPLOYMENTS ONLY. WE HAVE DEPLOYED TO CALIFORNIA, NEVADA, IDAHO, AND OREGON AS MUCH AS ONCE OR TWICE A YEAR.</p> <p>B) AREAS OF DEPLOYMENT INVOLVING THIS EQUIPMENT HAS RANGED FROM ALASKA TO TEXAS AND NEW MEXICO TO IDAHO AS WELL AS OSAN, KOREA. ALASKA, NEW MEXICO AND KOREA ARE WINTER DEPLOYMENTS. FURTHERMORE WE'VE HAD SUMMER DEPLOYMENTS IN BOISE, IDAHO AND SPOKANE, WASHINGTON.</p> <p>C) DURING DEPLOYMENTS THE NUMBER OF TIMES THE DOOR IS OPENED AND CLOSED IS SIGNIFICANTLY INCREASED TO AS MUCH AS FIVE TIMES GREATER.</p>
44	<p>A) MAGNA FLUX REQUIREMENT. RINGS SHOULD BE REMOVEABLE AND INTER-CHANGEABLE.</p>
49	<p>A) PRIMARY MISSION IS TESTING NEW SYSTEMS FOR THE TACS. MOST OF EQUIPMENT IS NOT DEPLOYED. SOME SHELTERS ARE KEPT INDOORS AND OTHERS ARE USED FOR STORAGE OR IN A STORED CONFIGURATION. THE TYC-10 AND ONE TSC-60 ARE ON MOBILITY STATUS.</p>

TABLE
ALL EQUIPMENTS
GENERAL COMMENTS

IDENT NO.	GENERAL COMMENT
50	A) EQUIPMENT SHIPPED TO KADENA 2/81 FROM HOLLOMAN AFB, NM.
51	A) PEOPLE REQUIRED ON ROOF TO REMOVE ROOF BLOCKS FOR PLACEMENT OF ROOF PANEL ON EXPANSION OF SHELTER. (TCC-77, TCC-76, TMQ-28, s-517).
53	A) PERSONNEL ON FOOF FOR CAMOUFLAGING.
56	A) NIGHT TIME TEARDOWN IS LIMITED DUE TO SAFETY.
60	A) PERSONNEL ON ROOF FOR CAMOUFLAGING.
61	A) PERSONNEL ON ROOF FOR CABLE ROUTING, ANTENNAE AND CORROSION CONTROL.
48	A) QUANTITY WAS DETERMINED BY SUBTRACTING EQUIPMENT QUANTITIES FOR THE 629TH, 626TH, 619TH AND 606TH FROM THE QUANTITIES GIVEN FOR THE 600TH TCG.

TABLE
ALL EQUIPMENTS
RELIABILITY COMMENTS

IDENT NO.	RELIABILITY COMMENT
1	A) LOCKING PIN AND RFI SEAL IN SHELTERS COULD BE BEEFED UP.
2	A) WHERE JACKS ATTACH TO SHELTERS, THE THREADS ON THE RIVNUT CORRODE. OCCASIONLY THE RIVNUTS BREAK LOOSE.
12	A) SHELTERS HAVE LEAKED.
15	A) THE FACT THAT MOISTURE IS TRAPPED BETWEEN THE INNER AND OUTER SKINS IS A CONTINUING PROBLEM IN SOME VANS.
22	A) THE LEVELING INDICATORS ON ALL FACILITIES HAVE HAD CONDENSATION/ MOISTURE PORBLEMS CAUSING CORROSION INSIDE THE GLASS TUBES.
24	A) RIVNUTS FREEZED UP (ICE).
27	A) CORROSION
28	A) ALL EXPANDABLES PROBLEMS WITH ROOF HINGE COVERS LEAKING.
32	A) JACK PADS. RUST INSIDE CYCLINDERS AFTER VAN SITS IN ONE SPOT FOR A LENGTH OF TIME. ALL VAN TYPES. PROBLEM ONLY WITH VANS STORED OUTSIDE. B) ALL VANS TEND TO NEED RESEALING AFTER A MOVEMENT. C) INSERTS HOLDING MOBILIZERS AND JACK PADS STARTING TO PULL OUT OF SHELTER. D) OUT RIGGER JACKS. THE GEAR MECHANISM IS NOT STRONG ENOUGH. ALSO INSERTS PULL OUT.
34	A) CHECK ON TEST FOR ICE BUILDING UP ON DOOR AND CONNECTORS. B) CHECK ON TEST FOR THE DOOR STOP IN WINDY CONDITIONS STOPS BREAK WHEN CAUGHT BY WIND.
39	A) TOO MANY SEAMS ON OLDER SHELTERS. B) REPLACED 5 DOOR HANDLES IN 8 YEARS (OUT OF 28 SHELTERS). WEAR ON HANDLE PIN. THEY REPLACE PIN WITH HEAVIER THREADED SCREW.
25	A) PROBLEMS LISTED ONLY EXAMPLES. MANY OTHER PROBLEMS ARISE AT TIMES.

TABLE
ALL EQUIPMENTS
RELIABILITY COMMENTS

IDENT NO.	REILABILITY COMMENT
28	A) ALL EXPANDABLES. PROBLEMS WITH ROOF HINGE COVERS LEAKING.
51	A) LEAKING GASKETS AND WARPING AND TWISTING OF SHELTERS, (TCC-76, TCC-77, TMQ-28, S-517). B) FLOORING MATERIAL TEARS UP EASILY AND IS HARD TO REPLACE, (TCC-76, TCC-77, TMQ-28, S-517).

TABLE
GENERAL COMMENTS
COMSEC EQUIPMENT

IDENT NO.	GENERAL COMMENT
40	A) INDICATED 2600 MILES DEPLOYMENT OVER PAVED ROADS, AND 1 TO 5 MILES ON EACH DEPLOYMENT FOR UNPAVED ROADS. ASSUMED THAT 2600 MILES WAS TOTAL FOR 3-4 DEPLOY- MENTS ROUND TRIP.
54	A) PERSONNEL ON ROOF TO INSTALL ANTENNA AND CORROSION CONTROL. B) S-141 - SOME SHELTERS ARE OLD; SOME WERE MANUFACTURED IN 1964. NO RECORDS. C) S-141 - NO FORKLIFT CAPABILITY. D) S-514 - SETUP OF SHELTER IS DIFFICULT. E) S-514 - SHELTER MOVED SLIGHTLY ON JACKS FOR ALIGNMENT. F) S-515 - SHELTER MOVED SLIGHTLY ON JACKS FOR ALIGNMENT APPROXIMATELY TWO FEET. G) S-280 - SHELTER TOO HEAVY FOR MOBILIZER OFF ROAD TRANSPORT. H) CRANE WRECKER OR MANUAL OFF LOADING USED. I) SOME S-141'S WERE MANUFACTURED IN 1964. DATA NO AVAILABLE. J) 1 EA. S-141 DROPPED 10 FT. K) EQUIPMENT ARE MOBILIZED ABOUT 15 TIMES/ YEAR. L) S-537 EQUIPMENT ON BASE 1 EA. 6 YRS., 1 EA. < 1 YR. M) H-585 EQUIPMENT ON BASE SINCE AT LEAST 1973.
61	A) GMS-451-581 (TSC-98) PERSONNEL ON ROOF FOR MAINTENANCE OF SHELTER AND AIR PUMP. B) SSRS-6258 PERSONNEL ON ROOF TO TIE DOWN CABLING OR TARPULINS OR THE LIKE. C) S-613 (TSC-105) PERSONNEL ON ROOF FOR ANTENNA SYSTEM, CABLING AND MAINTENANCE.

TABLE
RELIABILITY COMMENTS
CONSEC EQUIPMENT

IDENT NO.	RELIABILITY COMMENT
40	A) CONCERNED ABOUT MOISTURE GETTING IN BETWEEN INNER AND OUTER SKINS.
54	A) S-141 - MOISTURE PROBLEMS. B) S-141 - SHELTERS HAVE CORROSION PRO- BLEMS. C) S-514 and S-515 - SHELTER HARDWARE IS NOT RUGGEDIZED. VERY SUSCEPTIBLE TO CORROSION. REMOVEABLE WALLS NOT INTERCHANGEABLE WITH OTHER LIKE SHELTERS. D) S-537 - SHELTER HAS CORROSION PRO- BLEMS, BUT SO FAR ARE UNDER CONTROL. E) H-585 - TWO SHELTERS HAVE SEVERE CORROSION. F) S-280 - SOME EQUIPMENT INSIDE SHELTER NOT RUGGEDIZED FOR TACTICAL USE. G) S-280 - STRUCTURAL DAMAGE IN ONE SHELTER (FRAME IS BENT). LAMINATION ON WALL HAS SEPARATED.
61	A) SSRS-625B - ROOF LEAKS A LITTLE. THEY WERE CAULKED AT RIVET POINTS WITH RTV.

TABLE
GENERAL COMMENTS
ES-57, 58, 59, 65, 73

IDENT NO.	GENERAL COMMENT															
27	<p>A) ACCEPTANCE DATES.</p> <p>ES-59 - 4/78, 6/76, 9/78, 11/78, 12/79</p> <p>ES-57 - 11/79, 5/71</p> <p>ES-58 - 5/71, 12/76</p> <p>ES-65 - 3/71, 5/71</p> <p>ES-73 - UNKNOWN</p> <p>B) TIMES DOOR OPENED PER/DAY.</p> <table><tr><td>ES-59</td><td>57</td><td>58</td><td>65</td><td>73</td></tr><tr><td></td><td>100</td><td>100</td><td>50</td><td>10</td></tr><tr><td></td><td></td><td></td><td></td><td>20</td></tr></table>	ES-59	57	58	65	73		100	100	50	10					20
ES-59	57	58	65	73												
	100	100	50	10												
				20												
28	<p>A) SETUP ON JACKS, SETUP ON UNEVEN TERRAIN, AND ES-59 TWICE/YEAR ALL OTHERS 1/YEAR.</p> <p>B) TIMES DOOR OPENED PER/DAY.</p> <table><tr><td>ES-59</td><td>58</td><td>73</td><td>57</td><td>65</td></tr><tr><td></td><td>36</td><td>12</td><td>0</td><td>0</td></tr><tr><td></td><td></td><td></td><td>0</td><td>0</td></tr></table> <p>C) ACCEPTANCE DATES AND DEPOT DATES.</p> <p>ES-59 (1) 8/75, 2/79 (2) 12/67, 11/71, 12/74, 10/76, 4/78 (3) 8/68, 12/75, 10/71, 2/78, 3/81 (4) 1/76, 2/78, 2/80</p> <p>ES-57 (1) 4/68, 10/71, 9/75, 2/78, 2/80 (2) 1/68, 9/74, 2/78, 7/79</p> <p>ES-58 (1) 1/69, 11/71, 10/75, 2/78, 4/80 (2) 2/69, 3/78, 11/71, 3/75, 2/78</p> <p>ES-73 (1) 7/68, 2/78, 5/75, 5/79</p> <p>ES-65 (1) 11/67, 11/71, 1/77 (2) 1/68, 11/71, 2/78, 5/79 (3) UNK, 9/75, 2/78, 12/80</p>	ES-59	58	73	57	65		36	12	0	0				0	0
ES-59	58	73	57	65												
	36	12	0	0												
			0	0												

TABLE
GENERAL COMMENTS
ES-57, 58, 59, 65, 73

IDENT NO.	GENERAL COMMENT
32	<p>A) SAW ONE ES-59 DROPPED APPROXIMATELY 2 FOOT.</p> <p>B) ACCEPTANCE DATES AND DEPOT DATES.</p> <p>ES-59 (1) 6/68, 12/71, 7/77 (2) <8/69, 7/75, 1/79 (3) <8/69, 8/77, 11/79 (4) <8/69, 6/74, 1/76, 10/78</p> <p>ES-57 (1) 1/76 FROM DEPOT , 1/79</p> <p>ES-58 (1) <8/69, 10/75, 1/79 (2) <8/69, 1/75</p> <p>ES-65 (1) <8/69, 4/75 (2) <8/69, 5/75, 4/77 (3) 9/76 FROM DEPOT</p> <p>OTHERS UNKNOWN</p>
33	<p>A) SHELTERS HAVE BEEN AT UNIT SINCE 71-72. SHELTERS ARE 67-68 VINTAGE, ACCEPTANCE DATES ARE UNKNOWN.</p> <p>B) C-130 MAY BE USED TO MOVE SHELTERS TO/ FROM REMOTE SITE AND DEPOT.</p>

TABLE
RELIABILITY COMMENTS
ES-57, 58, 59, 65, 73

IDENT NO.	RELIABILITY COMMENT
25	A) ONE ES-58 FUNCTIONALLY ADEQUATE.
28	B) ES-59-VERSAMAT PROBLEMS, CHEMISTRY CORROSION.
32	A) ES-59-FLOOR DELAMINATIONS, WALL DELAMINA- TIONS. CHEMICALS CORRODE WALLS. HAVE HIGH TRAFFIC.
27	A) ES-59 - DELAMINATION OF FLOOR AND WALLS. B) WATER CHILLERS ON ES-57, 58, 59 DIFFICULT TO MAINTAIN. PROBLEMS WITH DEPOSITS IN HARD WATER AREAS. AVERAGE FAILURE 1/YEAR (ESTIMATE). C) FLOOR INSERTS ON 59 SHELTERS. PROBLEM WITH WATER GETTING INTO CORE CAUSING DELAMINATION OF THE FLOOR. D) DRAIN ON 59 SHELTER SHOULD HAVE A CONSISTENT 2" DRAIN. CURRENTLY HAS 2" TO 1/4" TO 1". A) CORROSION A PROBLEM.

TABLE
GENERAL COMMENTS
ES-60, 61, 63, 64, 72

IDENT NO.	GENERAL COMMENTS
27	<p>A) ACCEPTANCE DATED</p> <p>ES-60 - 10/79 ES-61 - 4/79 ES-63 - 2/80, 4/78 ES-64 - 4/79, UNKNOWN</p> <p>B) NO. OF TIMES DOOR OPENED/DAY</p> <p>ES-60, 61, 63 - 100 TIMES ES-64 - 130 TIMES</p>
28	<p>A) ACCEPTANCE DATES AND DEPOT DATES</p> <p>ES-60 (1) 5/68, 11/76 (2) 10/68, 11/76, 2/78</p> <p>ES-63 (1) 11/67, 4/78 (2) 12/67, 4/76, 1/78</p> <p>ES-64 (1) 11/67, 5/75, 2/78 (2) 12/67, 2/75, 2/79</p> <p>B) TIMES/YEAR EQUIPMENT IS SETUP ON JACKS, SETUP ON UNEVEN TERRAIN AND SETUP AT UNIT.</p> <p>ES-60, 61 - TWICE/YEAR ES-64 - ONCE/YEAR</p> <p>C) TIMES DOOR OPENED/DAY</p> <p>ES-60 - 240 TIMES ES-61, 64 - 0 TIMES</p>
32	<p>A) ACCEPTANCE DATES AND DEPOT DATES</p> <p>ES-60 (1) <8/69, 7/76, 10/78</p> <p>ES-61 (1) 2/76 FROM DEPOT, 7/80 (2) 3/77 FROM DEPOT</p> <p>ES-63 (1) 6/68, 9/76</p> <p>ES-64 (1) 11/67, 10/76 (2) <8/69, 5/79</p>

TABLE
GENERAL COMMENTS
ES-60, 61, 63, 64, 72

IDENT NO.	GENERAL COMMENT
32	B) TIMES DOOR OPENED/DAY ES-60, 61 - 540/DAY ES-63, 64 - 2/DAY
33	A) SHELTERS HAVE BEEN AT UNIT SINCE 71-72. SHELTERS ARE 67-68 VINTAGE, ACCEPTANCE DATES ARE UNKNOWN. B) C-130 MAY BE USED TO MOVE SHELTER TO/FROM REMOTE SITE AND DEPOT.

TABLE
RELIABILITY COMMENTS
ES-60, 61, 63, 64, 72

IDENT NO.	RELIABILITY COMMENT
25	A) ALL EQUIPMENTS FUNCTIONALLY ADEQUATE. B) ES-63 HAVE FILM TITLER DIFFICULTIES.
27	A) CORROSION LISTED AS PROBLEM.
28	A) ES-60, 61 HAVE FLOOR DELAMINATIONS AND HIGH TRAFFIC. B) ES-60, 61, 63, 64 HAVE WATER INTRUSION THRU ROOF HINGES AND ROOF EDGES OF EXPANDABLE PORTION IN GOOD HEAVY RAIN- STORM.

TABLE
GENERAL COMMENTS
FS-6

IDENT NO.	GENERAL COMMENT
27	A) ACCEPTANCE DATE ON ONE UNIT IS 4/71. OTHER UNITS UNKNOWN.
28	B) ONLY HAVE RECORDS AVAILABLE ON THREE SHELTERS. ACCEPTANCE DATES ARE 1/68, 7/68 and 7/68. EACH SHELTER WAS SENT BACK TO DEPOT THREE TIMES. DATES ARE 2/76, 2/78, 12/80; 5/76, 2/78, 3/81; 10/75, 2/78, 11/80.
29	A) THIS SHELTER IS USED FOR FILM STORAGE ONLY. THEY DID NOT HAVE ANY HISTORICAL RECORDS. CONTRACT YEAR ON BASE <4 YEARS. WAS SENT TO DEPOT IN 1976. DEPLOYMENT IS ON BASE. B) IF LOCKED-IN WINGNUT SAFETY RELEASE IS VERY DIFFICULT TO PERATE.
32	A) ACCEPTANCE DATE DEPOT DATES 6/68 9/74, 5/78 <3/72 2/75 <8/69 11/75 5/74 FROM DEPOT 1/77 FROM DEPOT
33	A) ACCEPTANCE DATE ON ONE SHELTER WAS 11/67. OTHERS UNKNOWN.

TABLE
RELIABILITY COMMENTS
FS-6

IDENT NO.	RELIABILITY COMMENT
25	A) 4 UNITS ASSIGNED, 3 FUNCTIONALLY ADEQUATE. ONE SHELTER IS AWAITING PARTS. B) AIR CONDITIONER FAILURES DUE TO CONSTANT OPERATION.
27	A) CORROSION A PROBLEM.
29	A) DELAMINATION IS A PROBLEM BUT IT IS MINIMAL ON THIS SHELTER. B) RIVNUTS HOLDING JACKS BECOME LOOSE. C) HAD MOISTURE INTRUSIONS THRU OPEN ENDED RIVETS. PROBLEM SOLVED WHEN STARTED USING SOLID RIVETS.

TABLE
GENERAL COMMENTS
FS-7

IDENT NO.	GENERAL COMMENT
27	A) ACCEPTANCE DATE ON ONE UNIT 4/79; OTHER UNKNOWN.
28	A) ACCEPTANCE DATE 11/67 DEPOT DATES 12/75, 2/78, 2/80 FOR ONE UNIT. OTHER UNITS UNKNOWN.
32	A) ACCEPTANCE DATES AND DEPOT REPAIR DATES; 2/68, 10/75, 3/81; <8/69, 7/78, 10/81.

TABLE
GENERAL COMMENTS
FS-7

IDENT NO.	GENERAL COMMENT
27	A) ACCEPTANCE DATE ON ONE UNIT 4/79; OTHER UNKNOWN.
28	A) ACCEPTANCE DATE 11/67 DEPOT DATES 12/75, 2/78, 2/80 FOR ONE UNIT. OTHER UNITS UNKNOWN.
32	A) ACCEPTANCE DATES AND DEPOT REPAIR DATES. 2/68, 10/75, 3/81; <8/69, 7/78, 10/80.

TABLE
RELIABILITY COMMENT
FS-7

IDENT NO.	RELIABILITY COMMENT
25	A) A MAJOR CONCERN IS PROPER CORROSION CONTROL OF EQUIPMENT AND SHELTER.
27	A) CORROSION A PROBLEM.
28	A) WATER INTRUSION THROUGH ROOF HINGES AND ROOF EDGES OF EXPANDABLE PORTION IN GOOD HEAVY RAIN STORM.
32	A) THE HINGES ROT OUT AFTER 5 YEARS OF OPERATION. SUPPORT BRACKET FOR LIFTING SUPPORT POLE IS WEAK AND SHOULD BE BEEFED-UP.

TABLE
GENERAL COMMENTS
MDC

IDENT NO.	GENERAL COMMENT
60	A) NO HEATER. B) PERSONNEL ON ROOF FOR CAMOUFLAGE AND A/C INSTALLA- TION.

TABLE
RELIABILITY COMMENTS
MDC

IDENT NO.	RELIABILITY COMMENT
60	A) SHELTER LEAKS.

TABLE
GENERAL COMMENTS
M.D.E.

IDENT NO.	GENERAL COMMENT
16	A) ACCEPTANCE DATE 1973. B) ASSUMED AIRCRAFT DEPLOYMENT FREQUENCY WAS OVER 8 YEARS. GIVEN AS 6 BUT DEPLOYMENT FREQUENCY GIVEN AS 3.

TABLE
GENERAL COMMENTS
N.C.M.O.

IDENT
NO.

GENERAL COMMENT

16

- A) ACCEPTANCE DATE 1972.
- B) FREQUENCY OF AIRCRAFT DEPLOYMENT GIVEN
AS 6. FREQUENCY OF DEPLOYMENT GIVEN
AS 3. ASSUMED AIRCRAFT DEPLOYMENT WAS
OVER 9 YEARS.

TABLE
GENERAL COMMENTS
TTY/CRYPTO

IDENT
NO.

GENERAL COMMENT

60

A) NO HEATER.

TABLE
GENERAL COMMENTS
UCP/JOB C

IDENT
NO.

GENERAL COMMENT

7

- A) PERSONNEL ON ROOF TO ERECT ANTENNA.
- B) ACCEPTANCE DATES ARE 1967 & 1969.

TABLE
GENERAL COMMENTS
V-83

IDENT NO.	GENERAL COMMENT
65	A) THESE VANS HAVE BEEN RE- BUILT TO BECOME A MOBILE COMMAND POST AND A MOBILE RADIO OPS VAN.

TABLE
RELIABILITY COMMENTS
V-83

IDENT NO.	RELIABILITY COMMENT
4	A) AFTER A LONG ROAD MARCH THE TOPS OF THE ROOFS LEAK.

TABLE
GENERAL COMMENTS
AN/TCC-76

IDENT NO.	GENERAL COMMENT
22	A) ACCEPTANCE DATE 1975. B) PERSONNEL ON ROOF FOR ANTENNA INSTALLATION.
24	A) ACCEPTANCE DATE 1974.
30	A) ACCEPTANCE DATE 10/74.
51	A) ACCEPTANCE DATE 1974.
64	A) ACCEPTANCE DATE 1975. B) ONE EQUIPMENT ON BASE FOUR YEARS, ONE 1 YEAR.

TABLE
RELIABILITY COMMENTS
AN/TCC-76

IDENT NO.	RELIABILITY COMMENT
24	A) PROBLEMS WITH RIVNUTS AND GASKETS. B) LEAKS DUE TO RIVNUTS AND GASKETS.
30	A) ROOF LEAKS THRU SEAMS WHEN SHELTERS ARE EXPANDED.
64	A) RAIN LEAKAGE CREATES AN ELECTRICAL HAZARD. THE RIVNUTS FASTENERS WEAR OUT TOO FREQUENTLY CAUSING EXTREME DIFFICULTY DURING SETUP.

TABLE
GENERAL COMMENTS
AN/TCC-77

IDENT NO.	GENERAL COMMENT
22	A) ACCEPTANCE DATE 1975.
24	A) ACCEPTANCE DATE 8/74.
30	A) ACCEPTANCE DATE 10/74.
51	A) ACCEPTANCE DATE 1974.
64	A) ACCEPTANCE DATE 1975.

TABLE
RELIABILITY COMMENTS
AN/TCC-77

IDENT NO.	RELIABILITY COMMENT
24	A) PROBLEMS WITH RIVNUTS AND GASKETS. B) LEAKS DUE TO RIVNUTS AND GASKETS.
30	A) ROOF LEAKS THROUGH SEAMS WHEN SHELTER IS EXPANDED.
64	A) RAIN LEAKAGE CREATES AN ELECTRICAL HAZARD. THE RIVNUTS FASTENERS WEAR OUT TOO FREQUENTLY CAUSING EXTREME DIFFICULTY DURING SETUP.

TABLE

GENERAL COMMENTS

AN/TGC-20

IDENT NO.	GENERAL COMMENT
6	A) MOBILIZER TYPE LISTED AS D735. B) WORKSPACE INSIDE SHELTER IS INADEQUATE. C) AGE OF EQUIPMENT AND NONAVAILABILITY OF PARTS A CONCERN.
15	A) ON ROOF TO ATTACH SLING HOOKS.
16	A) STATES 3 DEPLOYMENTS/TYPES AND 6 DEPLOYMENTS BY AIRCRAFT. ASSUMED THIS WAS OVER 11 YEARS EQUIPMENT WAS AT UNIT.
17	A) LISTS A D-735 AS MOBILIZER. B) SHELTER MUST BE POSITIONED BY HAND. MUST NOT PUSH BY VEHICLE.
51	A) PERSONNEL ON ROOF GIVEN AT 200 - 400. ASSUMED THIS WAS TOTAL.

TABLE
RELIABILITY COMMENTS
AN/TGC-20

IDENT NO.	RELIABILITY COMMENT
15	<p>A) ATTEMPTED TO COVER LARGE CORROSION AREAS ON ROOF WITH ALUMINUM SHEET USING RTV AND SHEET METAL SCREWS.</p> <p>B) EXPERIENCED CORROSION ON SHELTER ROOF SURFACES BOTH INNER AND OUTER AND DELAMINATION OF ROOF.</p> <p>C) CONCERNED WITH WATER CONTENT RUNNING BETWEEN OUTER AND INNER SKIN, WATER ENTERING THE INTERIOR ROOF OF THE SHELTER FOR LONG PERIODS OF TIME CAUSING HIGH HUMIDITY, CONDENSATION AND CORROSION OF INSTALLED ELECTRONIC EQUIPMENT.</p>
17	A) WILL NOT MEET TEMPEST REQUIREMENTS.

TABLE
GENERAL COMMENTS
AN/TGC-26

IDENT NO.	GENERAL COMMENT
22	A) ACCEPTANCE DATE 7/73 B) PERSONNEL ON ROOF TO ERECT/TEAR DOWN EQUIPMENT.
24	A) ACCEPTANCE DATE 7/73. B) PERSONNEL ON ROOF TO ASSEMBLE EQUIPMENT.
42	A) THE AIR CONDITIONING AND HEATING UNITS SHOULD BE DUCTED THROUGH THE WALLS TO REDUCE THE AMOUNT OF HEAT OR COLD BLOWING DIRECTLY ON SOMEONE.
64	A) PERSONNEL ON ROOF FOR INSTALLATION AND CAMOUFLAGE. B) ACCEPTANCE DATE 1974.

TABLE
RELIABILITY COMMENTS
AN/TGC-26

IDENT NO.	RELIABILITY COMMENT
22	<p>A) REMOVABLE WALLS/FLOOR/CEILING PANELS WARP EASILY CAUSING DELAMINATION OF SKIN SURFACES. ALSO INSUFFICIENT WEATHER/WATER SEAL. WEAK FLOOR UNDER THE ASR'S. (THIS IS PROBABLY CAUSED BY INSUFFICIENT SUPPORT OF THE FLOOR, CENTER SECTION). WE ARE EXPERIENCING WEAK AND DELAMINATED FLOORS IN ALL AREAS OF THE FACILITY.</p> <p>B) THE WEATHER STRIP MATERIAL USED ON THE REMOVABLE PANELS IS EASILY DAMAGED WHEN INSTALLING/REMOVING PANELS. NOTE: THIS UNIT USES A LOCALLY FABRICATED SILVER COLORED RUBBERIZED FABRIC COVER ON ALL 407L/433L SYSTEM VANS TO INSURE WEATHER PROTECTION AND ALSO TEMPERATURE CONTROL.</p> <p>C) THE FEMALE RIVNUTS WHICH SUPPORT REMOVABLE PANELS WHILE IN TRANSIT CONFIGURATION DO NOT HOLD SECURELY. VIBRATION, STRESS, CORROSION, ETC. CAUSES THE FEMALE PORTION OF THE FASTENER TO ROTATE AND TURN LOOSE. THERE DOES NOT SEEM TO BE SUFFICIENT STRUCTURAL AREA AROUND THE NUT TO HOLD THEM SECURELY. REPLACING THESE RIVNUTS IS VERY DIFFICULT BECAUSE ONCE THE DEFECTIVE NUT ROTATES, THERE IS INSUFFICIENT SOLID AREA TO HOLD THE NEW NUT.</p>
24	<p>A) PROBLEMS WITH RIVNUTS AND GASKETS.</p> <p>B) LEAKS DUE TO GASKETS AND RIVNUTS.</p>
42	<p>A) IT IS EXTREMELY EASY TO WARP THE SHELTERS IN THE FIELD. JACKS CAN SETTLE AND WHEN YOU TEAR IT DOWN, CORNERS HAVE A TENDENCY TO SAG MAKING IT EXTREMELY DIFFICULT TO LINE UP THE BOLT HOLES WHEN PUTTING THE SIDE WALL BACK ON. THESE ARE NOT MOBILE FACILITIES THEY ARE TRANSPORTABLE AND WOULD NOT BE RECOVERABLE UNDER FIRE. MOBILE COMM EQUIPMENT NEEDS TO BE READILY MOVED IN MINUTES NOT HOURS.</p>

TABLE
RELIABILITY COMMENTS
AN/TGC-26

IDENT
NO.

RELIABILITY COMMENT

64

- B) THE RIVNUTS DESIGN IS DEFECTIVE. A NEW DESIGN OR SYSTEM OF SETTING THE RIVNUTS IS NEEDED.
- C) THE RUBBER SHELTER SEALS ARE NOT WIDE ENOUGH OR THICK ENOUGH TO ADEQUATELY KEEP OUT THE RAIN.
- A) FLOOR BUCKLING, ROOF LEAKING AND RIVNUTS NOT HOLDING.
- B) ROOF LEAKING ON ELECTRONIC EQUIPMENT.

TABLE
GENERAL COMMENTS
AN/TGC-27

IDENT NO.	GENERAL COMMENT
18	A) PERSONNEL ON ROOF TO TIE DOWN SHELTER TO TRUCK.
30	A) COULD USE A BETTER REPAIR KIT.
51	A) PERSONNEL ON ROOF TO RUN CABLES FOR ROAD HAULING AND TO CHANGE OUT MOBILIZERS. B) PERSONNEL ON ROOF GIVEN AT 100-200. ASSUMED THIS WAS TOTAL.
60	A) CONCERN WITH MAGNESIUM IN SHELTER (EQUIPMENT RACK). B) PERSONNEL ON ROOF TO PREPARE CABLING FOR TRANSIT. C) ACCEPTANCE DATE 8/72.
64	A) PERSONNEL ON ROOF FOR INSTALLATION AND CAMOUFLAGING. B) ACCEPTANCE DATE 1972.

TABLE
RELIABILITY COMMENTS
AN/TGC-27

IDENT NO.	RELIABILITY COMMENT
7	DEVELOPED A LEAK IN THE ROOF WHICH CAUSED DELAMINATION OF THE INTERIOR SKIN OF THE SHELTER IN THE AREA OF THE LEAK.
18	LEVEL INDICATORS BROKEN IN SHIPMENT. THEY BREAK EASILY.
22	THE MATERIALS USED TO REINFORCE THE JACK PLATES ARE WEAK AND INADEQUATE. RIVITS DO NOT HOLD FIRMLY. BONDING PROCESS IS INSUFFICIENT. IN LIEU OF PUTTY/RIVIT METHOD, RECOMMEND MODIFICATION SIMILAR TO THE 433L TACTICAL WEATHER SYSTEM JACKS.
26	<p>A) PROBLEMS WITH LEVELING INDICATORS AND LOOSE/PULLED RIVNUTS.</p> <p>B) CONCERNED ABOUT MOBILIZER AND JACK ATTACHMENTS.</p> <p>C) CONCERNED ABOUT TEMPEST - EM RADIATION FROM WITHIN VAN - IS IT ADEQUATELY SHIELDED AS LOW POWER "HANDI-TALKIES" WORK FROM INSIDE THE SHELTER.</p>
30	<p>A) ONE SHELTER HAS FLOOR DELAMINATION ON RIGHT SIDE UNDER EQUIPMENT RACK. SOME UNITS HAVE FORKLIFT DAMAGE. ONE UNIT HAS DAMAGE TO ROOF THAT OCCURRED WHILE OFF-LOADING FROM AIRCRAFT.</p> <p>B) RFI SHIELD BEGINNING TO WEAROUT BUT THEY ARE AT LEAST 7 YEARS OLD.</p> <p>C) ONE UNIT HAD A BROKEN HANDLE ON AIR PRESSURE VALVE ON DOOR.</p> <p>D) THEY HAVE 3-4 STRIPPED RIVNUTS WHERE JACKS ATTACH.</p>

TABLE
GENERAL COMMENTS
AN/TGC-28

IDENT NO.	GENERAL COMMENT
11	A) ACCEPTANCE DATE 1973.
20	A) ACCEPTANCE DATE 3/72.
36	A) ACCEPTANCE DATES AND DEPOT DATES. (1) 6/73, 7/75, 4/79 (2) 2/72, 2/75
47	A) ACCEPTANCE DATE 2/72.
49	A) ACCEPTANCE DATE 12/71. B) NO. OF PEOPLE ON ROOF GIVEN AT 10. ASSUMED THIS WAS TOTAL AND NOT AT ONE TIME.
56	A) ACCEPTANCE DATE PRIOR TO 11/72.

TABLE
RELIABILITY COMMENTS
AN/TGC-28

IDENT NO.	RELIABILITY COMMENT
20	A) HAVE EXPERIENCED QUITE A BIT OF DELAMINATION OF THE CEILINGS, WALLS, AND FLOORS. B) SCHEDULED TO GO TO DEPOT IN 1982.

TABLE
GENERAL COMMENTS
AN/TGC-621

IDENT
NO.

GENEREAL COMMENT

1

SAFETY HATCH ON S-280 NOT FUNCTIONAL
WHEN SHELTER MOUNTED ON 21/2 TON TRUCK

TABLE
GENERAL COMMENTS
AN/TMQ-28

IDENT NO.	GENERAL COMMENT
22	A) ACCEPTANCE DATE 1975.
30	A) ACCEPTANCE DATES 10/74.
51	A) ACCPETANCE DATE 1974.
64	A) ACCEPTANCE DATE 1975.

TABLE
RELIABILITY COMMENTS
AN/TMQ-28

IDENT NO.	RELIABILITY COMMENT
22	A) PROBLEMS WITH RIVNUTS AND GASKETS. B) LEAKS DUE TO RIVNUTS AND GASKETS.
30	A) ROOF LEAKS THROUGH SEAMS WHEN SHELTERS ARE EXPANDED.
64	A) RAIN LEAKAGE CREATES AN ELECTRICAL HAZARD. THE RIVNUTS FASTENERS WEAR OUT TOO FREQUENTLY CAUSING EXTREME DIFFICULTY DURING SET UP.

TABLE
GENERAL COMMENTS
AN/TPB-1

IDENT NO.	GENERAL COMMENTS
1	THERE IS A PLAN TO HELILIFT THE TPB-1C.
34	HELILIFTED W/O MOBILIZER. THIS SHELTER WAS HELILIFTED BACK TO UNIT THE AFTERNOON OF THE DAY I WAS THERE.

TABLE
RELIABILITY COMMENTS
AN/TPB-1

IDENT NO.	RELIABILITY COMMENT
14	A) EXPERIENCED WARPING AND DELAMINATION OF INTERIOR FLOORS ON PREVIOUS S-280'S. B) PERSONNEL ON ROOF TO ERECT UHF ANTENNA AND FOR ERECTING NETTING CAMOUFLAGE.
34	A) ARRIVED WITH DELAMINATION ON SIDE PANEL. IT IS A NEW SHELTER.

TABLE
GENERAL COMMENTS
AN/MPN-14

IDENT NO.	GENERAL COMMENT
2	<p>A) ONE MPN-14 WAS IN DEPOT FOR REPAIR.</p> <p>B) THERE CAN BE 5 PEOPLE CARRYING A 800 lb. ANTENNA ON THE ROOF AT ONE TIME.</p>
51	<p>A) PERSONNEL ON ROOF TO INSTALL ANTENNAE, MASTS, ETC.</p> <p>B) THESE SYSTEMS ARE ON A NORMAL DEPOT TURN AROUND SCHEDULE OF 5 YEARS; THEREFORE WE ASSUME THAT THE SYSTEMS ASSIGNED THIS WORKCENTER HAVE BEEN OVERHAULED APPROXIMATELY 4 - 6 TIMES EACH.</p> <p>C) DUE TO THE NATURE OF OUR MISSION THE SHELTERS WHICH COMPOSE THE MPN-14 MOBILE RAPCON ARE SUBJECTED TO STRESSES NOT NORMALLY ENCOUNTERED IN A SYSTEM ASSIGNED TO A FIXED STATION. THE NUMEROUS SETUP/TEARDOWNS, THE FREQUENT ROAD HAULS, AND VARYING CLIMATIC CONDITIONS EXPEDITE THE DETERIORATION OF OUR VANS WHICH RESULTS IN OUT OF CYCLE INPUT TO DEPOT OR ON-SITE MOBILE DEPOT REPAIR.</p>

TABLE
GENERAL COMMENTS
AN/MPN-14

IDENT NO.	RELIABILITY COMMENT
51	D) SYSTEM #147 WAS RECENTLY REPAIRED BY MDM TEAM. ROFF PANELS WERE REPLACED AND RE-SEALED. E) SYSTEM #181 SHIPPED TO DEPOT FOR OUT OF CYCLE OVERHAUL IN EARLY APRIL 1981. F) SYSTEM S/N - 73, 100, 147, 181.
60	A) PERSONNEL ON ROOF TO ERECT ANTENNAE. B) THREE SHELTERS. TWO ACCEPTANCE DATES UNKNOWN. ONE IS 7/63.
64	A) PERSONNEL ON ROOF TO ERECT ANTENNA. B) EQUIPMENT ON BASE 1 - 4 YRS, 1 - 3 YRS, 1 - 1 YR.

TABLE
RELIABILITY COMMENTS
AN/MPN-14

IDENT NO.	RELIABILITY COMMENT
2	A) HAS CORROSION PROBLEMS. THEY LEAK. B) EXPERIENCE ALOT OF NOISE AND VIBRATION FROM AIR CONDITIONERS. C) HAVE EXPERIENCED WATER CONDENSATION AND FUNGUS.
51	A) PROBLEMS PRIMARLIY DELAMINATION OF THE HONEY COMB AND SEAM SEPARATION OF THE PANELS. THIS USUALLY RESULTS IN WATER INTRUSION AND EQUIPMENT DAMAGE.
60	A) CORROSION ON ROOF AND EXPANDING WALL.
64	A) ROOF LEAKS. BEING OVERHAULED AT DEPOT AT THIS TIME.

TABLE
GENERAL COMMENTS
AN/TPN-19

IDENT
NO.

GENERAL COMMENT

51

- A) SETUP/TEAR DOWN SYSTEM ANTENNA ON ASR SHELTER ONLY.
- B) ACCEPTANCE DATES 4 EA 1975, 2 EA 1974.
- C) ONE UNIT IS SCHEDULED FOR DEPOT (ACCEPTANCE DATE 1974).
- D) DATA VARIED FOR EACH SHELTER.

S/N	3	5	4	10	8	9
QUESTION NO.						
12	1	3	0	0	1	0
15	180	190	250	180	120	0
15a	6	6	2	2	6	6
16	2	3	1	2	3	1
17	1	3	0	0	2	3

- E) FOUR TO FIVE PEOPLE ON ASR SHELTER ONLY TO ERECT ANTENNA.

TABLE
RELIABILITY COMMENT
AN/TPN-19

IDENT NO.	RELIABILITY COMMENT
51	A) LEAKS AROUND EXISTING ENTRANCES AND SEALS. B) IF SHELTERS ARE NOT PROPERLY LEVELED, DOOR FRAMES WARP AND DOORS ARE HARD TO OPEN AND CLOSE. C) CONCERN WITH AREAS AROUND DOORS (SEALS).

TABLE
GENERAL COMMENTS
AN/TPS-43

IDENT NO.	GENERAL COMMENT
8	A) PERSONNEL ON ROOF TO INSTALL ANTENNAE. B) ACCEPTANCE DATE 1980.
9	A) PERSONNEL ON ROOF TO INSTALL ANTENNAE AND CAMOUFLAGE. B) ACCEPTANCE DATE 1980.
11	A) ACCEPTANCE DATE 1979.
13	A) ACCEPTANCE DATE 1980.
18	A) ACCEPTANCE DATE 1979.
19	A) ACCEPTANCE DATE 3/78. B) AIR CONDITIONER UNITS ARE INSUFFICIENT FOR COOLING THE EQUIPMENT IN HOT WEATHER. C) COST OF REPLACEMENT PARTS ARE EXTREMELY HIGH. D) QTY OF UNITS NOT GIVEN. ASSUMED ONE.
20	A) ACCEPTANCE DATE 10/77. B) PERSONNEL ON ROOF TO INSTALL ANTENNA.
26	A) ACCEPTANCE DATE 1979. B) PERSONNEL ON ROOF FOR INSPECTION AND CONNECTING ECU DUCTS.
30	A) ACCEPTANCE DATE 12/77.
34	A) POWER ENTRY PORT TOO CONGESTED.
36	A) ACCEPTANCE DATE 4/78.
37	A) ACCEPTANCE DATES 1979, 1980. B) PERSONNEL ON ROOF TO ERECT ANTENNAE.
38	A) ACCEPTANCE DATE 1980.

TABLE
GENERAL COMMENTS
AN/TPS-43

IDENT NO.	GENERAL COMMENT
41	A) ACCEPTANCE DATE 1977.
43	A) ACCEPTANCE DATE 1980.
38	A) ACCEPTANCE DATE 1980.
41	A) ACCEPTANCE DATE 1977.
43	A) ACCEPTANCE DATE 1980.

TABLE
GENERAL COMMENTS
AN/TPS-43

IDENT NO.	GENERAL COMMENT
50	A) PEOPLE ON ROOF TO INSTALL ANTENNAE.
47	A) ACCEPTANCE DATE 9/77.
48	A) ACCEPTANCE DATE 4/78. B) TOO SMALL.
49	A) ACCEPTANCE DATE 6/77. B) NO. OF PEOPLE ON ROOF GIVEN AT 10. ASSUMED THIS WAS TOTAL AND NOT AT ONE TIME.
50	A) ACCEPTANCE DATE 4/78.
56	A) ACCEPTANCE DATE 1975.
57	A) ACCEPTANCE DATE 1979. B) PERSONNEL ON ROOF GIVEN AT 24. ASSUMED THIS WAS TOTAL.

TABLE
RELIABILITY COMMENTS
AN/TPS-43

IDENT NO.	RELIABILITY COMMENT
31	A) SHELTER HAS ROOF DELAMINATION.
34	A) INSIDE DOOR GASKET FELL OFF. B) RIVNUTS COME LOOSE BUT NOT FREQUENT. C) STEPS TO ROOF ARE BENDING. D) VIDEO CABLE ONLY ENGAGES ON A COUPLE OF THREADS. E) MOBILE DEPOT MAINTENANCE TEAM REPLACED ROOF ON 6/80. F) RIVETS ON AIR CONDITIONER ARE LOOSE.
46	A) WATER LEAKAGE AROUND A/C DUCTS AND DOOR IS A MAJOR PROBLEM.
49	A) ROOF IS WARPED.
50	A) ROOF LEAKS W/O ANTENNA BASE INSTALLED.
45	A) CONCERN WITH RIVNUTS.
48	A) TOPS LEAK.
56	A) CONCERN WITH LIFT RINGS.

TABLE
GENERAL COMMENTS
AN/TPS-44

IDENT
NO.

GENERAL COMMENT

11

A) ACCEPTANCE DATE 1972.

TABLE
RELIABILITY COMMENTS
AN/TPS-44

IDENT NO.	RELIABILITY COMMENT
11	A) WATER ENTERS WALL AREA CAUSING SKIN DAMAGE. B) POOR SEALING OF JOINTS AND RIVETS.

TABLE
GENERAL COMMENTS
AN/TRC-26

IDENT
NO.

GENERAL COMMENT

64

- A) PERSONNEL ON ROOF TO ERECT ANTENNA.
- B) ACCEPTANCE DATE 1980.

TABLE
GENERAL COMMENTS
AN/TRC-32

IDENT NO.	GENERAL COMMENT
8	A) PERSONNEL ON ROOF TO ERECT ANTENNA.
57	A) PERSONNEL ON ROOF GIVEN AT 24. ASSUMED THIS WAS TOTAL.

TABLE
RELIABILITY COMMENT
AN/TRC-32

IDENT NO.	RELIABILITY COMMENT
57	A) SHELTER LEAKS.

TABLE
GENERAL COMMENTS
AN/TRC-36/61

IDENT NO.	GENERAL COMMENT
5	A) ON ROOF TO ATTACH CABLES.
6	A) 3 EACH TRC-36'S AND 5 EACH TRC-61'S.
7	A) ON ROOF TO INSTALL ANTENNA.
10	A) 3-TRC-61'S AND 5-TRC-36'S. B) YEARS EQUIPMENT LOCATED AT UNIT TRC-61 - 8, 6, 2 TRC-36 - 5, 5, 5, 7, 7
15	A) HELILIFT AND RAIL DEPLOYMENT LISTED AS POSSIBLE BUT FREQUENCY NOT GIVEN. B) ON ROOF OF 36 WHEN ATTACHING SLING HOOKS. ON ROOF OF 61 WHEN WORKING ON AIR CONDITIONER, WHEN ATTACHING SLING HOOKS, AND WHEN INSTALLING ANTENNA. C) 5 EA TRC-36 AND 3 EA TRC-61.
17	A) 5 EA TRC-36'S, 3 EA TRC-61'S. B) 1 EA TRC-61 ON BASE FOR 2 YRS; 2-TRC-61'S ON BASE FOR 7 YEARS. C) ACCEPTANCE DATES FOR ALL TRC-36'S AND TRC-61'S IS 1960. D) ALL SHELTERS WERE RECOVERED FROM SALVAGE APPROXIMATELY IN 1964. E) TRC-61 SHELTER TOO SMALL FOR ITS NEEDS.
60	A) INADEQUATE STORAGE. B) INSUFFICIENT MOUNTING OF SAFETY BOARDS; CLOCKS (NO SPACE).
65	A) 5 EA TRC-36 AND 5 EA TRC-61. B) 8 EQUIPMENTS ON BASE 12 YRS. AND 2 FOR 1 YEAR.

TABLE
RELIABILITY COMMENTS
AN/TRC-36/61

IDENT NO.	RELIABILITY COMMENT
15	<p>A) TRC-61 - CORROSION OF ROOF SURFACES, SEPARATION OF ROOF OUTER SKIN FROM FRAME, CORROSION OF THE INNER ROOF AND SIDE WALL SKIN.</p> <p>B) TRC-61 - CONCERNED WITH WATER CONTENT RUNNING BETWEEN THE OUTER AND INNER SKIN, WATER ENTERING THE INTERIOR ROOF FOR LONG PERIODS OF TIME CAUSING HIGH HUMIDITY, CONDENSATION AND CORROSION OF INSTALLED ELECTRONIC EQUIPMENT.</p> <p>C) TRC-61 - HAVE ATTEMPTED TO RE-ATTACH S-150 SHELTER OUTER SKIN AT BOTTOM DOOR LIP USING RTV AND SHEET METAL SCREWS. WE HAVE PATCHED GOUGES ON OUTER SIDE WALLS WITH ALUMINUM SHEET USING RTV AND SHEET METAL SCREWS. THE ROOF AND SIDE WALL PATCHES SEEM TO SUFFICE BUT THE DOOR LIP IS A CONTINUING PROBLEM.</p>
16	<p>A) CEILINGS TEND TO CORRODE FREQUENTLY WHILE THE OTHER PARTS OF THE SHELTER DO NOT. THE ROOF FAIRS WELL IN OUR SITUATION.</p>
17	<p>A) TRC-61 - HELO SHELTERS HAVE BODY ROT.</p>
60	<p>A) CEILING TILES TEND TO FALL DOWN.</p>

TABLE
GENERAL COMMENTS
AN/TRC-87

IDENT NO.	GENERAL COMMENT
11	A) ACCEPTANCE DATE 1978. B) LACK OF SPACE INSIDE SHELTER FOR MAINTENANCE PERSONNEL AND TEST EQUIPMENT SEVERELY LIMITS MAINTENANCE ON THE EQUIPMENT.
20	A) YEARS SHELTERS HAVE BEEN AT UNIT ARE 1 EA FOR 3 YEARS AND 2 EA FOR 10 YEARS.
26	A) THE TRC-87 IS BUILT IN THE SHELTER ORIGINALLY USED OFR THE TRC-32. OURS WERE BUILTUP IN 1979-1980 WITH MINIMAL RECONDITIONING OF THE SHELTERS
36	A) ACCEPTANCE DATES AND DEPOT DATES. <11/71, 8/75 <1/68, 12/73 <1/68, 7/73 1/67 FROM DEPOT, 7/72
47	A) SERIAL NOS. OF VANS 00017, 3575-8 AND 3575-10. ASSUME #00017. WAS PRODUCED IN FIRST YEAR OF PRODUCTION. B) SHELTER IS TOO SMALL. NEEDS 6" to 8" MORE IN HEIGHT. VERY DIFFICULT TO WORK ON TOP ROW OF EQUIPMENT. C) DISPLACEMENT OF EQUIPMENT ALL ON ONE SIDE IS A CONCERN DURING LOADING/UNLOADING.
52	A) PERSONNEL ON ROOF FOR ERECTING ANTENNA AND FOR INSPECTION.
56	A) ACCEPTANCE DATES AND SERIAL NUMBER: S/N11, 6/76; S/N32, 3/69; S/N34, 6/74.

TABLE
REILIABILITY COMMENTS
AN/TRC-87

IDENT NO.-	RELIABILITY COMMENT
26	A) MOISTURE ACCUMULATES IN DOOR CAUSING CORROSION. B) CAN'T ADAPT XM-720 MOBILIZERS DUE TO INADEQUATE STRUCTURE.
56	A) CONCERN WITH LIFTING RINGS.

TABLE
GENERAL COMMENTS
AN/TRC-96

IDENT NO.	GENERAL COMMENT
65	A) THIS SHELTER HAS BEEN REBUILT TO BECOME A TECH CONTROL SHELTER.

TABLE
AN/TRC - 97

IDENT NO.	GENERAL COMMENTS
1	THERE IS A PLAN TO HELICOPTER LIFT THE TRC-97. SHOULD BE HIGHER.
3	THE TRC-97's ARE REPLACEMENTS FOR TWO OTHERS WHICH WERE RETURNED TO DEPOT.
5	SHELTER IS TOO SMALL.
6	WORKSPACE INSIDE FACILITY INADEQUATE. HUMIDITY PROBLEMS.
8	SHELTER IS TOO SMALL TO CARRY ON EFFECTIVE MAINTENANCE. THE SHELTER IS NOT HIGH ENOUGH TO STAND UP IN AND YOU MUST WORK IN A SEMI-CROUCH AT ALL TIMES. THE SHELTER IS TOO SMALL TO HOUSE THE BAREST MINIMUM OF TEST EQUIPMENT. IN WORKING IN THE TOP DRAWER, THERE IS NOT ENOUGH ROOM TO GET A HEAD ABOVE THE DRAWER TO CHECK EQUIPMENT OR NUMBERS. WHEN A DRAWER IS PULLED OUT, YOU CAN'T MOVE FROM THE FRONT TO REAR, OR VICE VERSA, OF THE SHELTER.
9	SHELTER TOO SHORT.
11	LACK OF SPACE INSIDE OF SHELTER FOR MAINTENANCE PERSONNEL AND TEST EQUIPMENT.
15	THE EQUIPMENT WAS SENT TO DEPOT FOR SHELTER REPAIR ONLY.
16	S308/TRC-97 SHELTERS WERE DEPOT REPAIRED IN 1978.
30	A) WRECKER USED. TOP LIFT. NO SPREADER BARS. B) FOUR OF THE UNITS ARE PERMANENTLY DEPLOYED IN CENTRAL GERMANY. TIME EQUIPMENT LOCATED AT BASE IS AVERAGE FOR 4 UNITS. OTHER FOUR UNKNOWN.
34	A) SHELTER IS LOADED/UNLOADED FROM 3/4 TON TRUCK AT LEAST 1/MONTH.
35	A) TOP PICKUP WITH WRECKER. NO SPREADER BARS.
36	A) SHELTERS ARE RESEALED ANNUALLY B) TOPLIFT USED BY WRECKER. NO SPREADER BARS ARE USED.
37	A) SHELTER IS TOO SMALL TO ACCOMODATE PERSONNEL AND/OR EQUIPMENT REQUIRED TO SUPPORT THE AN/TRC-97A.
38	A) SHELTER IS TOO SMALL TO ACCOMODATE PERSONNEL AND/OR EQUIPMENT REQUIRED TO SUPPORT THE AN/TRC-97A.
41	A) THE INSIDE CEILING HEIGHT OF THIS SHELTER IS 5'7" AND THEREFORE NOT HIGH ENOUGH TO CONTAIN A PERSON WHICH EXCEEDS THIS HEIGHT. IT CREATES DISCOMFORT HAVING TO BEND OVER WHILE MAKING OPERATIONAL CHICKS AND ALIGNMENTS.
46	A) THE VAN IS TOO SMALL TO PROVIDE EASE OF MAINTENANCE.
51	A) THE VAN IS TOO SMALL TO WORK IN. B) MORE WORK SPACES NEED TO BE PROVIDED. C) PERSONNEL ON ROOF TO SETUP COMOUFLAGE AND ATTACH ANTENNA TO ROOF MOUNT.

TABLE
GENERAL COMMENTS
AN/TRC-97

IDENT NO.	GENERAL COMMENT																						
52	A) SHELTER IS NOT HIGH ENOUGH. B) PROBLEM WITH GROUNDING SYSTEM. C) PERSONNEL ON ROOF FOR INSPECTION. D) EQUIPMENT ON BASE: 1 EA 2 YR, 1 EA 4 YR, 1 EA 5 YR.																						
53	A) PERSONNEL ON ROOF TO ATTACH LIFT CHAINS AND FOR CAMOU- FLAGE. B) SHELTER TOO SMALL, ESPECIALLY WHEN DRAWERS ARE EXTENDED. C) NO PROVISION FOR AIR CONDITIONER HOOKUP. D) EQUIPMENT ON BASE: 1 EA 6 YR, 1 EA 0.5 YR.																						
48	A) ACCEPTANCE DATE 2/77. B) TOO SMALL.																						
50	A) ACCEPTANCE DATES: UNKOWN AND 6/80.																						
51	A) ACCEPTANCE DATES: 1 EA 1967, 5 EA 1981, 1 EA UNKOWN.																						
55	A) EQUIPMENT ON BASE: 1 EA 9 YR, 1 EA 2 YR.																						
56	A) ACCEPTANCE DATES: <table> <tr> <th data-bbox="645 1297 678 1325">SN</th><th data-bbox="901 1297 1129 1325">ACCEPTANCE DATE</th></tr> <tr> <td data-bbox="617 1346 690 1373">13-31</td><td data-bbox="964 1346 1025 1373">9/76</td></tr> <tr> <td data-bbox="617 1388 690 1415">13-55</td><td data-bbox="948 1388 1025 1415">10/76</td></tr> <tr> <td data-bbox="617 1430 690 1457">13-64</td><td data-bbox="964 1430 1025 1457">4/78</td></tr> <tr> <td data-bbox="617 1472 690 1499">13-76</td><td data-bbox="948 1472 1025 1499">10/76</td></tr> <tr> <td data-bbox="634 1514 674 1541">122</td><td data-bbox="964 1514 1025 1541">9/76</td></tr> <tr> <td data-bbox="634 1556 674 1583">147</td><td data-bbox="948 1556 1025 1583">10/76</td></tr> <tr> <td data-bbox="634 1598 674 1625">166</td><td data-bbox="964 1598 1025 1625">5/75</td></tr> <tr> <td data-bbox="634 1640 674 1667">242</td><td data-bbox="948 1640 1025 1667">10/76</td></tr> <tr> <td data-bbox="634 1682 674 1709">313</td><td data-bbox="964 1682 1025 1709">4/81</td></tr> <tr> <td data-bbox="634 1724 674 1751">287</td><td data-bbox="964 1724 1025 1751">4/81</td></tr> </table>	SN	ACCEPTANCE DATE	13-31	9/76	13-55	10/76	13-64	4/78	13-76	10/76	122	9/76	147	10/76	166	5/75	242	10/76	313	4/81	287	4/81
SN	ACCEPTANCE DATE																						
13-31	9/76																						
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313	4/81																						
287	4/81																						

TABLE
GENERAL COMMENTS
AN/TRC-97

IDENT NO.	GENERAL COMMENT
57	A) TWO EQUIPMENTS ON BASE 5 YRS AND TWO FOR 2 YRS.
58	A) ACCEPTANCE DATE 10/69.
60	A) ACCEPTANCE DATE 11/73.
63	A) SHELTER DROPPED 3 FEET.
64	A) ACCEPTANCE DATES 1966, 1975, 1976, 1977.
65	A) PERSONNEL ON ROOF FOR TERRAIN SIGHTING. B) SHELTER IS TOO LOW (CEILING).

TABLE

AN/TRC - 97

IDENT NO.	RELIABILITY COMMENTS
5	PROBLEMS WITH SHELTERS LEAKING.
10	SHELTERS LEAKED AT SEAMS UNTIL REPAIRED.
11	CORROSION ON INNER AND OUTER SKIN CAUSED BY CONDENSATION BETWEEN WALLS.
16	THE RUBBER STRIP THAT COVERS VENT DOOR HINGES CRACKS QUICKLY ALLOWING MOISTURE TO ENTER HINGE AREA.
23	WATER INFILTRATION INTO ROOF AND WALLS.
26	A) SKIN CORROSION. B) LIFT AND TIEDOWN RINGS NOT STRONG ENOUGH.
30	A) RFI SEALS COME LOOSE AND NEED REGLUED. RUBBER WEATHER SEALS OVER EXHAUST COVERS AND DOOR VENT BECOME DRY ROTTED IN 4-5 YEARS.
31	A) TRC-97 HAS A CRACKED LIFTING RING.
34	A) HINGES ON VENT COVERS (RUBBER) ARE DRY ROTTED. ONLY LAST 3 YEARS. B) CONNECTOR ACCESS PORT TEI SHIELD IS DESTROYED WHEN PANEL IS REMOVED. HAD CONSIDERABLE PROBLEMS WITH BREAKAGE OF THE CONNECTORS WHEN THEY WERE PLASTIC.
36	A) RIVNUTS BECOME LOOSE PRIMARILY AROUND THE SIGNAL/POWER ENTRY PANELS.
52	A) DELAMINATION OF SHELTER WALLS DUE TO VIBRATION WHEN DEPLOYING.
56	A) PROBLEMS HAVE BEEN EXPERIENCED WITH WATER LEAKS AND DOORS OUT OF ALIGNMENT.
63	A) SEAMS LEAK.
64	A) BELOW THE A-S DRAWER ASSEMBLY, THE RIVETS HAVE PULLED OUT OF THE SHEET METAL.
65	A) ROOF OF ONE SHELTER HAS DETERIORATED TO THE POINT WHERE THE INSULATION GOT VERY WET AND A NEW ROOF HAD TO BE PUT ON.

TABLE
GENERAL COMMENTS

IDENT NO.	AN/MRC - 113	GENERAL COMMENT			
12	A) ASSUMED ONE SYSTEM CONSISTING OF 15 SHELTERS. BREAKDOWN IS AS FOLLOWS:				
	LL	MUZ	PA	PA	
	S-385	S-456	S-386	S-458	
QTY	5	5	4	1	
DAYS OPERATED	320	320	50	-	
HRS OPERATED	24	24	8	-	
B) TIMES DOOR OPENED/DAY: LL= 10, MUZ = 10, PA = 3, PA =--.					
C) THE S-458 PA DID NOT HAVE ANY USAGE OR DEPLOYMENT INFORMATION LISTED.					
D) MILES MOBILIZED OVER PAVED ROADS WAS 8000 AND ONE DEPLOYMENT TO CA LISTED ASSUMED THIS WAS ROUND TRIP.					
E) PERSONNEL ON ROOF TO INSTALL ANTENNAE.					

TABLE
GENERAL COMMENTS
AN/TRC-136

IDENT NO.	GENERAL COMMENT
7	A) PERSONNEL ON ROOF TO INSTALL ANTENNA.
17	A) PERSONNEL ON ROOF TO INSTALL ANTENNA.
30	A) ACCEPTANCE DATES ARE 1969, OTHER IS UNKNOWN BUT ACCEPTED FROM DEPOT ON 7/75.

TABLE
RELIABILITY COMMENTS
AN/TRC-136

IDENT NO.	RELIABILITY COMMENT
30	A) RFI SEALS ARE WEARING OUT AFTER APPROXIMATELY 6 YEARS.

TABLE
GENERAL COMMENTS
AN/GRM-48

IDENT NO.	GENERAL COMMENT
23	A) THIS EQUIPMENT HAS BEEN HELILIFTED, BUT THE FREQUENCY WAS GIVEN AS "AS REQUIRED". B) SHELTER REPORTED AS BEING TOO SMALL.
60	A) ACCEPTANCE DATE 1969.

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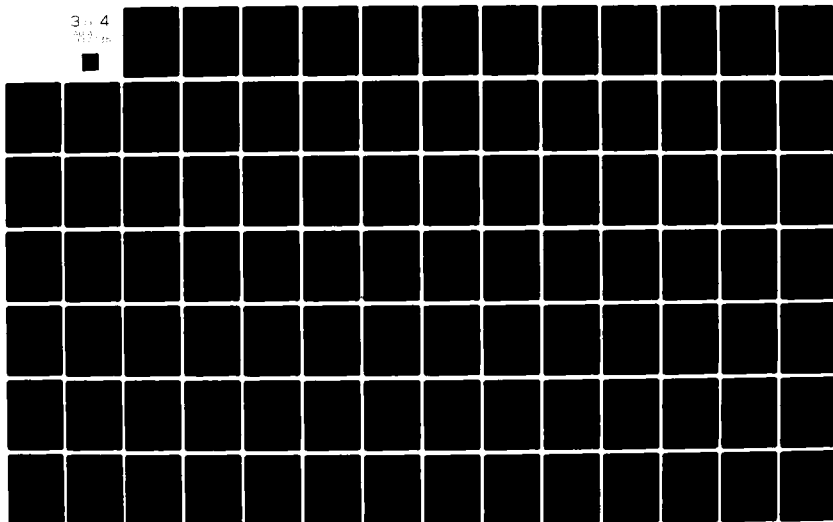
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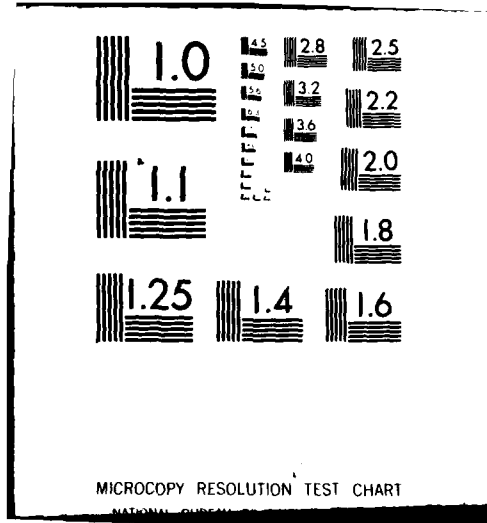


TABLE
GENERAL COMMENTS
AN/GRM-85

IDENT NO.	GENERAL COMMENT
34	A) ACCEPTANCE DATE OF THIS SHELTER IS UNKNOWN BUT EARLIEST RECORDED DATE ON HISTORICAL RECORD IS 1/69. SHELTER WENT TO DEPOT FOR REPAIR IN 5/73 AND 1/79.
35	A) ACCEPTANCE DATE IS 10/66. SHELTER SENT TO DEPOT FOR REPAIR IN 11/73 AND 1/79. B) SHELTER DOES NOT HAVE LIFT RINGS.
36	A) THIS UNIT HAS BEEN OPERATING AS A FIXED STATION FOR 1.5 YEARS. DEPLOYMENT INFORMATION IS FOR PRE-FIXED STATION OR NORMAL OPERATION.
44	A) ACCEPTANCE DATE 1/77.
49	A) 1 EA SHELTER AT THIS LOCATION. IT IS CON-DEMND AND USED FOR STORAGE. NO DATA AVAILABLE.

TABLE
RELIABILITY COMMENT
AN/GRM-85

IDENT NO.	RELIABILITY COMMENT
46	A) WATER PROOFING AT DOOR A PROBLEM.

TABLE
GENERAL COMMENTS
AN/GRM-94

IDENT NO.	GENERAL COMMENT
8	A) PERSONNEL ON ROOF TO ATTACH LIFTING DEVICE.
23	A) HELILIFT IS PERFORMED, BUT FREQUENCY IS GIVEN AS "AS REQUIRED".
31	A) VERY DIFFICULT TO CLIMB UP ON ROOF BECAUSE OF ICE FORMING IN RECESSED HAND- HOLDS. B) WENT TO DEPOT 9/75.
34	A) WENT TO DEPOT 5/75. B) ECU SHOULD BE MOUNTED ON PALLET RATHER THAN INSIDE SHELTER.
35	A) WENT TO DEPOT 4/73 DUE ON 7/81.
36	A) THIS UNIT HAS OPERATED AS A FIXED STATION FOR 1.5 YEARS. DEPLOYMENT DATA IS FOR PRE-FIXED STATION OPERATION. B) ONE SHELTER RECEIVED FROM DEPOT 6.73. NO HISTORICAL RECORDS FOR OTHER SHELTER.
48	A) ONE UNIT SENT TO DEPOT IN 1976 AND ONE IN 1977. B) ACCEPTANCE DATE 9/74.
60	A) ACCEPTANCE DATE 1968.

TABLE
RELIABILITY COMMENTS

IDENT NO.	AN/GRM-94	RELIABILITY COMMENT
31		A) STEP/HANDHOLD BROKEN. B) HAS A PUNCTURE ON SIDE. CAUSE UNKNOWN.

TABLE
GENERAL COMMENTS
AN/TRN-31

IDENT NO.	GENERAL COMMENT
51	A) PERSONNEL ON ROOF TO INSTALL CABLES AND ANTENNA.

TABLE
GENERAL COMMENTS
AN/TSC-15

IDENT NO.	GENERAL COMMENT
3	A) THESE UNITS ARE REPLACEMENTS FOR TWO OTHERS THAT WERE RETURNED TO DEPOT.
8	A) SHELTER IS TOO SMALL TO CARRY ON EFFECTIVE MAINTENANCE. THE SHELTER IS NOT HIGH ENOUGH TO STAND UP IN AND YOU MUST WORK IN A SEMI-CROUCH AT ALL TIMES. THE SHELTER IS TOO SMALL TO HOUSE THE BAREST MINIMUM OF TEST EQUIPMENT. THIS BECOMES MORE CRITICAL IN TIMES OF INCLEMENT WEATHER. B) PERSONNEL ON ROOF TO ATTACH LIFTING DEVICE AND TO MOUNT ANTENNA.
10	A) PERSONNEL ON ROOF TO ERECT ANTENNA.
16	A) THIS FORM DOES NOT APPEAR TO BE FILLED OUT CORRECTLY. THE DATA SHOULD BE DISCOUNTED.
18	A) PERSONNEL ON ROOF TO INSTALL ANTENNA.
38	A) SAW ONE SHELTER DROPPED 1.5 FOOT.
52	A) PERSONNEL ON ROOF TO INSTALL ANTENNA AND FOR INSPECTION.

TABLE
RELIABILITY COMMENTS
AN/TSC-15

IDENT NO.	RELIABILITY COMMENT
10	A) EQUIPMENT LEAKED IN AT SEAMS UNTIL REPAIRED.
38	A) SHELTER RUNNERS/SKIDS ARE NOT STRONG ENOUGH TO SUPPORT THE SHELTER IF THEY ARE NOT HANDLED CAREFULLY. ALSO LIFTING RINGS ON TOP OF SHELTER ARE NOT STRONG ENOUGH.
52	A) DELAMINATION OF SHELTER WALLS DUE TO VIBRATION WHEN DEPLOYING.
63	A) PROBLEM WITH DOOR FRAME.

TABLE
GENERAL COMMENTS
AN/MS-22

IDENT NO.	GENERAL COMMENT
15	A) ON ROOF TO INSTALL WHIP ANTENNAE.
16	B) STATED 3 DEPLOYMENTS/YEAR AND 6 DEPLOYMENTS BY AIR. ASSUMED THIS WAS OVER 10 YEARS EQUIPMENT WAS AT UNIT.
60	A) NO HEATER. B) TOO BIG; AWKWARD. C) ACCEPTANCE DATE 2/56.

TABLE
RELIABILITY COMMENT
AN/MS-22

IDENT NO.	RELIABILITY COMMENT
60	A) A/C INOPERATIVE.

TABLE
GENERAL COMMENT
AN/TSC-38

IDENT NO.	GENERAL COMMENT
12	A) PERSONNEL ON ROOF TO INSTALL ANTENNA. B) ONE OF THESE SHELTERS IS DEPLOYED. C) SHELTERS IS IN DEPOT NOW.

TABLE
GENERAL COMMENTS
AN/TSC-53

IDENT NO.	GENERAL COMMENT
11	A) ACCEPTANCE DATE 1972. B) PERSONNEL ON ROOF TO INSTALL ANTENNAE
31	A) ACCEPTANCE DATE 9/67 DEPOT IN 9/75.
34	A) ACCEPTANCE DATE 11/68 DEPOT IN 12/76 AND 9/80.
35	A) ACCEPTANCE DATE <3/68 DEPOT IN 7/73 AND 3/77. DUE TO GO IN 7/81. B) NO FILTRATION CONCERN WITH CBR. C) DIFFICULT TO MOBILIZE WITH A/C ATTACHED.
41	A) SHELTER IS APPROXIMATELY 18 YEARS OLD.
50	A) PEOPLE ON ROOF TO INSTALL ANTENNAE.
44	A) ACCEPTANCE DATE 6/71.
48	A) UNIT SENT TO DEPOT IN 77 AND 80. B) ACCEPTANCE DATE 5/74.
50	A) ACCEPTANCE DATE 7/67.

TABLE
RELIABILITY COMMENTS
AN/TSC-53

IDENT NO.	RELIABILITY COMMENT
13	A) THE RIVETS THAT HOLD ANTENNA TO ROOF LOOSEN AND CAUSE LEAKAGE.
31	A) SHELTER HAS FLOOR DELAMINATION. B) SHELTER HAS LOOSE RIVETS. C) RFI SEALS COME LOOSE AND BREAK. D) HAS NO SUPPORT UNDER ANTENNA. CONCERNED THAT ANTENNA BASE WILL BE RIPPED OFF IF ANTENNA SLIPS DURING ERECTION. THE CORNER OF THE ROOF WAS TORN OFF WHEN A HELILIFT SLING CAUGHT BOTTOM OF ANTENNA BASE. LOOSE RIVNUTS WOULD NOT ALLOW REMOVAL OF BASE PRIOR TO HELILIFT.
34	A) SHELTER HAD WATER INTRUSION BEFORE SENT TO DEPOT IN CEILING AND SIDEWALL. B) 3 OF 15 RIVNUTS WERE STRIPPED IN WALL. C) WATER INTRUSION THRU ROOF AND DELAMINATION.
46	A) WEATHER PROOFING AT DOOR HAS BEEN A BIG PROBLEM.
50	A) ROOF LEAKS W/O ANTENNA BASE INSTALLED.
45	A) FLOOR AND ROOF DELAMINATIONS.

TABLE
GENERAL COMMENTS
AN/TSC-60

IDENT NO.	GENERAL COMMENT
36	A) ACCIDENTAL DROP WAS WHEN SHELTER SLID OFF BED OF 2 1/2 TON WHEN 407L LOADING KIT WINCH SLIPPED.
52	A) PERSONNEL ON ROOF FOR INSPECTION. B) EQUIPMENT ON BASE: 1 EA 9 YR, 2 EA 1 YR, 1 EA < 1 YR.
53	A) WOULD LIKE TO SEE AC MOUNTED ON FRONT OF VAN LIKE WINDOW AIR CONDITIONERS. B) ACCEPTANCE DATE 1978.
55	A) PERSONNEL ON ROOF TO ERECT SHELTER. B) ACCEPTANCE DATE 1978.
60	A) INSTALLATION OF A/C A PROBLEM. B) CONCERN WITH MAGNESIUM IN SHELTERS (EQUIPMENT RACK). C) ACCEPTANCE DATE 4/80 and 1974.
64	A) THERE IS A CONCERN ABOUT THE MAGNESIUM CONTENT IN THE SHELTER; ESPECIALLY IF THERE IS A FIRE. B) PERSONNEL ON ROOF TO INSTALL CAMOUFLAGE AND CABLES. C) ACCEPTANCE DATES 1972, 1973.
57	A) ACCEPTANCE DATE 1979.

TABLE
GENERAL COMMENTS
AN/TSC-60

IDENT NO.	GENERAL COMMENT																												
51	<p>A) SHELTER CANNOT BE BACKED UP USING A VEHICLE.</p> <p>B) ACCEPTANCE DATES: 4 EA 5/79 AND 2 EA 7/79.</p> <p>C) DIFFERENT DATA GIVEN FOR THE SHELTERS:</p> <table> <tr> <td>QTY</td><td>4</td><td>2</td></tr> <tr> <td>QUESTION</td><td></td><td></td></tr> <tr> <td>NO.</td><td></td><td></td></tr> <tr> <td>14</td><td>8</td><td>4</td></tr> <tr> <td>15</td><td>240</td><td>120</td></tr> <tr> <td>15a</td><td>6</td><td>4</td></tr> <tr> <td>16</td><td>24</td><td>12</td></tr> <tr> <td>17</td><td>8</td><td>4</td></tr> <tr> <td>17e</td><td>6</td><td>3</td></tr> </table> <p>DATA ON SUMMARY FORM ARE AVERAGES.</p>		QTY	4	2	QUESTION			NO.			14	8	4	15	240	120	15a	6	4	16	24	12	17	8	4	17e	6	3
QTY	4	2																											
QUESTION																													
NO.																													
14	8	4																											
15	240	120																											
15a	6	4																											
16	24	12																											
17	8	4																											
17e	6	3																											
63	A) ACCEPTANCE DATE 1 - 10/74, 2 - 5/80.																												
65	<p>A) ACCEPTANCE DATE 1978.</p> <p>B) SHELTER CONSTRUCTED WITH MAGNESIUM ALUMINUM. CONCERNED WITH FIRE.</p>																												

TABLE
RELIABILITY COMMENTS
AN/TSC-60

IDENT NO.	RELIABILITY COMMENT
2	ROOF FOAM RUBBER DETERIORATES (CRUMBLES)
11	CORROSION ON INNER AND OUTER SKIN CAUSED BY CONDENSATION BETWEEN WALLS.
26	THE SHELTER THAT HAS BEEN THERE 27 MONTHS (S/N 0031) HAS ROOF, WALL OR CORNER LEAKS.
36	A) DOOR STOPS BREAK IN WINDY CONDITIONS. B) ACOUSTICAL TILES ON CEILING DETERIORATE. C) VENTS FOR A/C OPEN DOWN AND WATER RUNS INTO SHELTER THRU THEM.
51	A) SHELTERS LEAK DURING HEAVY RAINS. ACCUMULATES MOISTURE WHEN HUMIDITY IS HIGH.
53	A) FLOOR BUCKLED UPON ARRIVAL, WATER DAMAGE WAS CAUSE.
64	A) THE CEILING FOAM INSULATION DETERIORATES AND FALLS FROM THE CEILING.
49	A) ACCEPTANCE DATES 11/72 AND 2/73. B) NO. OF PERSONNEL ON ROOF GIVEN AT 25. ASSUMED THIS WAS TOTAL AND NOT AT ONE TIME.

TABLE
GENERAL COMMENTS
AN/TSC-62

IDENT NO.	GENERAL COMMENT
20	A) PERSONNEL ON ROOF TO ERECT ANTENNA.
22	A) PERSONNEL ON ROOF TO INSTALL ANTENNA.
51	A) ANTENNA MOUNT NEEDS TO BE MOVED FOR EASIER ACCESS DURING INSTALLATION/TEAR DOWN OF CONNECTIONS. B) PERSONNEL ON ROOF TO INSTALL ANTENNA AND IN CAMOUFLAGE.
52	A) PERSONNEL ON ROOF TO INSTALL ANTENNA AND FOR INSPECTION.
64	A) PERSONNEL ON ROOF TO INSTALL ANTENNA AND CAMOUFLAGE. B) ACCEPTANCE DATES 1976, 1977.
49	A) ACCEPTANCE DATES UNKNOWN AND 1/72. B) PERSONNEL ON ROOF GIVEN AT 25. ASSUMED THIS WAS TOTAL AND NOT AT ONE TIME.
56	A) ACCEPTANCE DATE 10/76.

TABLE
RELIABILITY COMMENTS
AN/TSC-62

IDENT NO.	RELIABILITY COMMENT
4	A) THE JACK STAND MOUNTING RIVENUTS ARE NOT STURDY ENOUGH TO PERMIT A PROLONGED STAND WITH THE JACKSTANDS BOLTED IN PLACE.
20	A) SHELTER HAS EXPERIENCED QUITE A BIT OF DELAMINATION OF THE CEILINGS, WALLS AND FLOORS. THE SHELTER WENT TO DEPOT FOR DELAMINATION REPAIR.
22	A) THE MATERIALS USED TO REINFORCE JACK PLATES ARE WEAK AND INADEQUATE. RIVETS DO NOT HOLD FIRMLY. BONDING PROCESS IS INSUFFICIENT. IN LIEU TO PUTTY/ RIVIT METHOD, RECOMMEND MODIFICATION SIMILAR TO 433C TACTICAL WEATHER WEATHER SYSTEM JACKS.
52	A) DELAMINATION OF SHELTER WALLS DUE TO VIBRATION WHEN DEPLOYING. B) PROBLEM WITH GROUNDING SYSTEM.
57	A) SHELTER LEAKS.

TABLE
GENERAL COMMENTS
AN/MSQ-10

IDENT NO.	GENERAL COMMENT
7	A) PERSONNEL ON ROOF TO ERECT ANTENNA. B) ACCEPTANCE DATE IS 1962.
60	A) ACCEPTANCE DATE 1960.

TABLE
GENERAL COMMENTS
AN/TSQ-61

IDENT NO.	GENERAL COMMENT
11	A) ACCEPTANCE DATE 1972.
18	A) ACCEPTANCE DATE 1980. B) PERSONNEL MUST CLIMB ON ROOF TO TIE DOWN SHELTER ON TRUCK.
19	A) AIR CONDITIONER UNITS SHOULD BE REMOVED DUE TO THE HIGH NOISE LEVEL THEY PRODUCE.
31	A) SHELTER FROM McCLELLAN IN 7/79. B) SHELTER S/N 002. C) POSITION OF DOOR LATCH NOT CONVENIENT FOR LOCK. SHOULD BE LOWER IN RECESS.
35	A) ACCEPTANCE DATE 12/68. DEPOT DATES 7/73, 2/79. B) DIFFICULT TO MOBILIZE WITH A/C ATTACHED. C) NO FILTRATION CONCERN WITH CBR.
37	A) ACCEPTANCE DATE 1972-5, 1974-7.
43	A) THIS UNIT IS HOME BUILT, NOT A FACTORY TSQ-61.
44	A) ACCEPTANCE DATE 1973.
48	A) ACCEPTANCE DATE 11/68. B) UNIT SENT TO DEPOT IN 73 AND 80.
50	A) ACCEPTANCE DATE 7/67.

TABLE
RELIABILITY COMMENTS
AN/TSQ-61

IDENT NO.	RELIABILITY COMMENT
11	A) WATER ENTERS WALL AREA CAUSING SKIN DAMAGE. B) POOR SEALING OF JOINTS AND RIVETS.
31	A) SHELTER HAS FLOOR DELAMINATIONS. B) HAS LOOSE RIVNUTS. C) LEVELING JACK MOUNTING PLATE REPAIRED 4/73.
34	A) J100 BROKE LOOSE AND ROTATED.
45	A) PROBLEM WITH RIVNUTS.
48	A) TOPS LEAK.

TABLE
GENERAL COMMENTS
AN/TSQ-91

IDENT NO.	GENERAL COMMENT												
20	<p>A) THERE ARE 8 SHELTERS. EACH ONE HAS BEEN SENT TO DEPOT ONCE. ACCEPTANCE DATE 8/72.</p> <p>B) PERSONNEL ON ROOF OF SHELTERS FOR INSPECTION, REPAIR AND INSTALLATION/ DISASSEMBLY OF THE SYSTEM.</p>												
36	<p>A) THIS EQUIPMENT IS COMPRISED OF 3 CELLS. ACCEPTANCE DATE GIVEN AS 2/72. ONE DEPOT REPAIR AT 4/73.</p>												
39	<p>A) NUMBER OF SHELTERS NOT GIVEN.</p> <p>B) ONE SHELTER SENT TO DEPOT IN 8 YEARS. 2 OR 3 SHELTERS DUE 5/81. THEY ARE ON 5 YEAR DEPOT MAINTENANCE CYCLE.</p> <p>C) THEY HAVE MADE SOME MODIFICATIONS TO ONE SHELTER. THEY ADDED SOME MOUNTINGS ON THE WALLS.</p>												
47	<table> <tr> <td>A) CONSISTS OF</td><td>DOOR OPENINGS</td></tr> <tr> <td>1 EA OA-8447</td><td>0</td></tr> <tr> <td>1 EA OA-8450</td><td>0</td></tr> <tr> <td>1 EA TSA-35</td><td>2</td></tr> <tr> <td>3 EA OA-8446</td><td>-</td></tr> <tr> <td>3 EA TSA-34</td><td>75</td></tr> </table> <p>B) OA-8447 SENT TO DEPOT ONCE.</p>	A) CONSISTS OF	DOOR OPENINGS	1 EA OA-8447	0	1 EA OA-8450	0	1 EA TSA-35	2	3 EA OA-8446	-	3 EA TSA-34	75
A) CONSISTS OF	DOOR OPENINGS												
1 EA OA-8447	0												
1 EA OA-8450	0												
1 EA TSA-35	2												
3 EA OA-8446	-												
3 EA TSA-34	75												
56	<p>A) ACCEPTANCE DATE 10/72.</p> <p>B) DEPOT DATES 1975 AND 1978.</p>												

TABLE
RELIABILITY COMMENTS
AN/TSQ-91

IDENT NO.	RELIABILITY COMMENT
20	A) HAVE EXPERIENCED QUITE A BIT OF DELAMINATION OF THE CEILINGS, WALLS AND FLOORS.
39	A) HAS SEVERE WATER LEAKAGE ON ALL SHELTERS. B) HAVE TO SETUP TSQ-91 ON AN ANGLE (VERY SLIGHT) TO ALLOW FOR WATER TO DRAIN OFF THE BUBBLE. THIS CAUSES THE DOOR SEAL TO LEAK AND ALLOW WATER TO ENTER. C) FORK LIFT PORTS NOT LARGE ENOUGH TO ALLOW FOR ENTRY OF EXTENDERS FOR 10 TON FORK-LIFT. CAUSES DAMAGE TO BOTTOM OF SHELTERS AND SKIDS.

TABLE
GENERAL COMMENTS
0A-8448/TSQ-92

IDENT NO.	GENERAL COMMENT
26	A) PART OF TSQ-92. B) PERSONNEL ON ROOF TO ALIGN AND JOIN MODULES.

TABLE
GENERAL COMMENTS
AN/TSA-34/TSQ-92

IDENT NO.	GENERAL COMMENT
26	A) PART OF TSQ-92. B) PERSONNEL ON ROOF FOR SETUP. (ALIGN AND JOIN MODULES).

TABLE
GENERAL COMMENTS
AN/TSA-35/TSQ-92

IDENT NO.	GENERAL COMMENT
26	A) PART OF TSQ-92. B) PERSONNEL ON ROOF TO ALIGN AND JOIN MODULES.

TABLE
GENERAL COMMENTS
AN/TSQ-93

IDENT NO.	GENERAL COMMENT
3	<p>A) CONSISTS OF ONE COMMAND 20PS MODULES. ONE 5 TON EXPANDABLE VAN, 1 OPS AND 1 COMM MODULE SET UP CONTINUOUSLY AT UNIT. ONE 5 TON EXPANDABLE AND 1 OPS MODULE ARE DEPLOYED.</p> <p>B) ONLY DOOR USED IS ON 5 TON VAN.</p> <p>C) OPS MODULE MFGR YR IS 1967.</p>
23	<p>A) CONSISTS OF THREE SHELTERS. ONE EACH OA-8451 AND TWO EACH OA-8452.</p>
55	<p>A) PERSONNEL ON ROOF TO ERECT SHELTER.</p>

TABLE
RELIABILITY COMMENT
AN/TSQ-93

IDENT NO.	RELIABILITY COMMENT
3	A) WILL BE TURNED-IN SOON FOR REPAIR BECAUSE OF ROOF DAMAGE, WATER INTRUSION AND CORROSION.
23	A) WATER INFILTRATION INTO ROOF AND WALLS.

TABLE
GENERAL COMMENTS
OA-8451/TSQ

IDENT NO.	GENERAL COMMENT
53	A) ACCEPTANCE DATE 1970.

TABLE
GENERAL COMMENTS
OA-8452/TSQ

IDENT
NO.

GENERAL COMMENT

53

A) ACCEPTANCE DATE 1971.

TABLE
GENERAL COMMENTS
AN/GSQ-120

IDENT NO.	GENERAL COMMENT
11	A) ACCEPTANCE DATE 1980.
20	A) ACCEPTANCE DATE 7/79.
36	A) ACCEPTANCE DATE 6/79. B) TOP LIFTED WITH WRECKER, NO SPREADER BARS.

TABLE
GENERAL COMMENTS
AN/TSW-7

IDENT NO.	GENERAL COMMENT
30	A) ONE EQUIPMENT AT BASE 10 YEARS. OTHER UNKNOWN.
60	A) ACCEPTANCE DATE 11/71.
64	A) PERSONNEL ON ROOF TO INSTALL WEATHER EQUIPMENT AND ANTENNA. B) ACCEPTANCE DATE 1973. C) EQUIPMENT ON BASE. 1 FOR 6 YRS AND 1 FOR 1 YR.

TABLE
RELIABILITY COMMENTS
AN/TSW-7

IDENT NO.	RELIABILITY COMMENT
2	A) TSW-7 BOWS IN MIDDLE AND DOOR BINDS UNLESS PERFECTLY LEVELED. B) AE32 SUPPORT STRUCTURE ON TSW-7 BASICALLY IS UNSUPPORTABLE BECAUSE OF POOR DESIGN.
30	A) HAD ONE JACK FOOT BREAK. B) SUPPORT STRUCTURE UNSAFE (UNSTABLE).

TABLE
GENERAL COMMENTS
AN/TTC-7

IDENT
NO.

GENERAL COMMENT

15

A) ACCEPTANCE DATE 1964.

TABLE
RELIABILITY COMMENTS
AN/TTC-7

IDENT NO.	RELIABILITY COMMENT
15	<p>A) CORROSION OF INTERIOR AND EXTERIOR ROOF AND DELAMINATION OF ROOF AND SIDE WALL.</p> <p>B) CONCERNED WITH WATER CONTENT RUNNING BETWEEN THE OUTER AND INNER SKIN, WATER ENTERING THE INTERIOR OF THE SHELTER FOR LONG PERIODS CAUSING HIGH HUMIDITY, CONDENSATION AND CORROSION OF INSTALLED ELECTRONIC EQUIPMENT.</p>

TABLE
GENERAL COMMENTS
AN/TTC-22

IDENT NO.	GENERAL COMMENT
60	A) A/C INADEQUATE COOL OR HEAT. B) ACCESS TO BATTERY STORAGE IS DIFFICULT. C) PERSONNEL ON ROOF FOR PREPARING CABLING FOR TRANSIT AND FOR A/C INSTALLATION. D) ACCEPTANCE DATE 5/74. E) UNIT DROPPED ONE TIME 2 FEET.
64	A) DROP LEAF ACCESS DOOR TO REAR OF SWITCH BOARD IS NOT READILY ACCESSABLE TO MAINTENANCE. B) ACCEPTANCE DATE 1973. C) ONE SHELTER SENT TO DEPOT ONCE, ONE TWICE.
16	A) ACCEPTANCE DATE 1971. B) AIRCRAFT FREQUENCY GIVEN AS 8. DE- PLOYMENT FREQUENCY GIVEN AS 3. ASSUMED 8 WAS OVER 10 YEARS.

TABLE
RELIABILITY COMMENT
AN/TTC-22

IDENT NO.	RELIABILITY COMMENT
60	A) LEAKS IN ROOF, DOOR AND OUTER EQUIPMENT DOOR.
64	A) WEAR AND TEAR ON THE BOLTS AND CHAINS IS EXCESSIVE.

TABLE
GENERAL COMMENTS
AN/TTC-30

IDENT NO.	GENERAL COMMENT
20	A) ACCEPTANCE DATE 1971.
26	A) THIS EQUIPMENT CONSISTS OF TWO SHELTERS. B) A SHELTER WAS ACCIDENTLY DROPPED PRIOR TO THEIR RECEIPT OF THE EQUIPMENT. DISTANCE IT FELL IS UNKNOWN. C) REPLACEMENT ALIGNING PINS ARE NOT AVAILABLE.
30	A) ACCEPTANCE DATES ARE UNKNOWN BUT ARE PRIOR TO 8/73. EQUIPMENT CONSISTS OF TWO SHELTERS.
36	A) ACCEPTANCE DATES AND DEPOT DATES. S/N 12 6/72 TO DEPOT 8/76 S/N 16 5/80 FROM DEPOT B) THERE ARE TWO TTC-30'S HERE. ONE IS ON LOAN FROM LINDSEY AIR STATION.
47	A) THE VANS ARE PULLED APART WHILE ON JACKS DURING TEARDOWN.
64	A) PERSONNEL ON ROOF TO INSTALL LIGHTNING ARRESTORS AND CAMOUFLAGE. B) SHELTER MOVED ON JACKS DURING SETUP AND TEARDOWN PROCEDURES. C) ACCEPTANCE DATE 1970.
47	A) ACCEPTANCE DATE 8/71.
49	A) TWO SHELTERS: OA-8491 AND OA-8489. ACCEPTANCE DATE 9/71. B) PERSONNEL ON ROOF GIVEN AT 25. ASSUMED THIS WAS TOTAL AND NOT AT ONE TIME.

TABLE
GENERAL COMMENTS
AN/TTC-30

IDENT NO.	GENERAL COMMENT
56	A) ACCEPTANCE DATE 5/72. B) CONCERN WITH FIRE.

TABLE
RELIABILITY COMMENTS

AN/TTC-30

IDENT NO.	RELIABILITY COMMENT
26	A) ALIGNMENT AND JOINING OF SHELTERS. POOR WEATHER SEAL BETWEEN SHELTERS.
30	A) DELAMINATION ON REAR OF SHELTER. B) THERE ARE TWO BROKEN JACK FEET. C) SCREWS ON NAME PLATE ARE RUSTING. D) LIGHTNING RODS BEND AND BECOME LOOSE WHEN CAMOULAGE NETS CATCH IN THEM. E) RFI SHIELD BETWEEN SHELTERS WEARS OUT AFTER APPROXIMATELY 10 SETUP/TEARDOWNS OR 1 YEAR. F) ONE SHELTER HAS FLOOR DELAMINATION. G) THE BOLTS ON REMOVABLE DOORS CORRODE AND MATING PORTION FOR SCREWS COME OFF.
36	A) WELD BROKE ON JACK AND TOP CAME OFF. B) ONE SHELTER HAS FLOOR DELAMINATIONS. ONE OF THE SHELTERS ON LOAN.

TABLE
GENERAL COMMENTS
AN/TYC-8

IDENT NO.	GENERAL COMMENTS
2	<p>A) REPAIRED TWICE AT CLARK (1975,1979) FLOOR REPAIRED AND ALL ACOUSTIC CEILINGS.</p> <p>B) NEEDS ONE CRANE, 2-10 TON FORKLIFTS AND ONE K-LOADER TO LOAD/UNLOAD.</p> <p>C) EXPERIENCE NOISE AND VIBRATION FROM AIR CONDITIONERS.</p> <p>D) DOOR LATCH AND DOOR SIZE SHOULD BE STANDARDIZED.</p> <p>E) SAW ONE VAN FALL FROM CRANE APPROXIMATELY 3 FEET.</p>
5	A) ON ROOF TO PAINT TRAILER.
15	A) ON ROOF TO WORK ON AIR CONDITIONERS.
51	<p>A) PERSONNEL ON ROOF FOR SUNSCREEN CANOPY SETUP/ TEARDOWN.</p> <p>B) REAR WHEEL DOLLY SPRINGS SEEM WEAK. THE TIRES ARE MARKED FROM FRAME ON ROAD HAULING/BOUNCING.</p> <p>C) ACCEPTANCE DATE 1970.</p>
64	<p>A) PERSONNEL ON ROOF TO INSTALL WALKWAY BETWEEN VANS AND TO INSTALL CAMOUFLAGE.</p> <p>B) EQUIPMENT ON BASE 1 - 6 YRS AND 1 - 4 YRS.</p>
65	A) ACCEPTANCE DATE 1971.

TABLE
RELIABILITY COMMENTS
AN/TYC-8

IDENT NO.	RELIABILITY COMMENT
2	A) HAS CORROSION PROBLEMS. THEY LEAK. B) HAVE EXPERIENCED WATER CONDENSATION AND FUNGUS.
51	A) CATWALK/CANOPY ASSY. POLES INADEQUATE. REQUIRE LOCK REPAIR AS PARTS FOR RE- PLACEMENT ARE UNAVAILABLE.
64	A) DETERIORATION OF FRAME AND WOODEN FLOORS. B) THE HYDRAULIC LINES THAT CONTROL THE MOVING OF THE EQUIPMENT BAY HAVE DETER- IORATED AND HAD TO BE REPLACED IN 1980.

TABLE
GENERAL COMMENTS
AN/TYC-10

IDENT NO.	GENERAL COMMENT
1	<p>A) TYC-10 WAS SETUP ONCE AND HASN'T BEEN MOVED.</p> <p>B) MAY HAVE TO USE A CRANE TO LOAD/UNLOAD BUT HAVE NEVER SEEN IT DONE.</p> <p>C) CONSISTS OF THREE SHELTERS: 1 EA AEM, 1 EA DPM AND 1 EA ACM.</p>
47	<p>A) CONSISTS OF THREE SHELTERS: AEM, DPM AND ACM.</p> <p>B) ACCEPTANCE DATES 5/78 FOR ALL THREE.</p> <p>C) NO. OF TIMES DOOR OPENED AEM = 0, DPM = 40, ACM = 0.</p> <p>D) T.O. REFERS TO TSQ-91 TO FOR DOOR HINGES, BUT HINGES WILL NOT FIT.</p>
49	<p>A) CONSISTS OF THREE EQUIPMENTS OA-8447B, OA-8450C AND OA8904T.</p> <p>B) ACCEPTANCE DATE 3/78.</p> <p>C) PERSONNEL ON ROOF GIVEN AT 52. ASSUMED THIS WAS TOTAL AND NOT AT ONE TIME.</p>
62	<p>A) CONSISTS ON 1 - OA-8447B, 1 - OA-8450C AND 1 - OA-8904.</p>

TABLE
RELIABILITY COMMENTS
AN/TYC-10

IDENT NO.	RELIABILITY COMMENT
1	A) SEVERAL PUNCTURES HAVE CAUSED WATER DAMAGE. PUNCTURES HAVE BEEN REPAIRED. THEY ARE ALSO SCHEDULED FOR MOBILE DEPOT REPAIR.
47	A) HINGES ON DPM DOOR CRACKED SEVERLY. VERY INADEQUATE. DOOR ABOUT TO FALL OFF.

TABLE
GENERAL COMMENTS
S-138TR

IDENT NO.	GENERAL COMMENT
23	A) SHELTER TOO SMALL.

TABLE
RELIABILITY COMMENTS

IDENT NO.	S-141	RELIABILITY COMMENT
23		A) WATER INFILTRATION INTO ROOF AND WALLS.

TABLE
GENERAL COMMENTS
S-280

IDENT NO.	GENERAL COMMENT
9	<p>A) QTY OF EQUIPMENTS NOT COMPLETE. ASSUMED THREE UNITS SINCE THEY WERE LISTED IN THREE DIFFERENT COLUMNS.</p> <p>B) TWO SHELTERS ON BASE 5 YEARS AND ONE 9.5 YEARS.</p> <p>C) TWO SHELTERS DEPLOYED BY XM-720 AND ONE BY 2 1/2 TON TRUCK.</p> <p>D) TWO SHELTERS USED 350 DAYS/YEAR AND ONE 35-40 DAYS/YEAR.</p>
17	<p>A) THESE SHELTERS WERE RECOVERED FROM SALVAGE APPROXIMATELY 1978.</p> <p>B) SHELTER IS LOADED/UNLOADED WITH A M-816.</p>
26	<p>A) PERSONNEL ON ROOF TO ATTACH LIFT DEVICES; ALSO CABLE LISTED AS LOAD/UNLOAD DEVICE; THEREFORE A CRANE OR WRECKER IS PROBABLY USED TO LOAD/UNLOAD SHELTER FROM THE TRUCK. 463L PALLET IS LISTED AS TYPE OF MOBILIZER.</p>
31	<p>A) NO HISTORICAL RECORDS. ACCEPTANCE DATE IS UNKNOWN, BUT SHELTERS HAVE BEEN AT UNIT <3 YEARS.</p> <p>B) NUMBER OF TIMES DOOR OPENED/DAY IS 10-15/HR FOR ONE SHELTER AND 1/HOUR FOR TWO SHELTERS.</p> <p>C) TOP LIFT USED TO LOAD/UNLOAD. NO SPREADER BAR USED.</p>
34	<p>A) ONE SHELTER IS NOT USED. THE OTHER THREE ARE USED. THE RESPONSES LISTED ARE AVERAGES FOR 15 AND 15 ARE FOR FOUR UNITS.</p>

TABLE
GENERAL COMMENTS
S-280

IDENT NO.	GENERAL COMMENT
35	A) NO HISTORICAL RECORDS. B) NO PROVISIONS FOR VENTILATION ON S-280. C) TOP PICKUP USED AND NO SPREADER BARS.
36	A) NO HISTORICAL RECORDS. B) THIS UNIT HAS OPERATED AS A FIXED STATION FOR 1.5 YEARS. DEPLOYMENT DATA IS FOR PRE-FIXED STATION OPERATION.
44	A) EQUIPMENT DROPPED DURING 407L LOADING DEMONSTRATION. ONE SIDE SLID DOWN BACK OF TRUCK. B) ACCEPTANCE DATE 9/78.
52	A) PERSONNEL ON ROOF FOR INSPECTION.
48	A) ACCEPTANCE DATE 11/77.
49	A) PERSONNEL ON ROOF GIVEN AT 50. ASSUMED THIS WAS TOTAL AND NOT AT ONE TIME.
57	A) PERSONNEL ON ROOF LISTED AS 12. ASSUMED THIS WAS TOTAL.

TABLE
RELIABILITY COMMENTS
S-280

IDENT NO.	RELIABILITY COMMENT
9	A) ONE SHELTER REPORTED AS HAVING A BAD FLOOR. IT IS THE SHELTER DEPLOYED BY TRUCK AND USED 350 DAYS/YEAR. SHELTER ON BASE 5 YRS.
35	A) DOOR HINGES COME LOOSE AND BREAK OFF.
52	A) DELAMINATION OF SHELTER WALLS DUE TO VIBRATION WHEN DEPLOYING.

TABLE
GENERAL COMMENTS
S-517

IDENT NO.	GENERAL COMMENTS
22	A) ACCEPTANCE DATE 1975.
30	A) ACCEPTANCE DATE 10/74.
51	A) ACCEPTANCE DATE 1974.

TABLE
RELIABILITY COMMENTS
S-517

IDENT NO.	RELIABILITY COMMENT
24	A) PROBLEMS WITH RIVNUTS AND GASKETS. B) LEAKS DUE TO RIVNUTS AND GASKETS.
30	A) ROOF LEAKS THROUGH SEAMS WHEN SHELTERS ARE EXPANDED.

TABLE

IDENT NO.	GENERAL COMMENTS S-530	GENERAL COMMENT
1	A) UNIT WAS SETUP ONCE AND HASN'T BEEN MOVED. B) ONE S-530 SETUP WITH ONE SIDE ON CONCRETE APRON AND ONE SIDE 1FT LOWER ON GROUND.	
3	A) TAKES TOO LONG TO SETUP/TEARDOWN FOR THEIR TACTICAL MISSION. B) IF S-530 COULD BE SETUP ON MOBILIZER IT WOULD HELP THEIR MISSION.	
2	A) COMMENTS ON S-530 ARE FROM ONE RESPONDENT WHERE S-530 WAS LOCATED AT PREVIOUS UNIT. B) NO WAY TO CONTROL ECU FROM SHELTER AND POWER TO ECU DOES NOT GO THRU SHELTER (ESPECIALLY REQUIRED IN CASE OF "CORKER" INCIDENT OR CHEMICAL ATTACK). C) S-530 DOOR LIFTS OFF HINGES WHEN ECU IS REMOVED BY HOIST.	
9	A) STEP TOO HIGH.	
26	A) S-530 IS MOVED ON JACKS FOR ALIGNMENT.	
36	A) THE S-530 HAS BEEN ERECTED TWICE IN ONE YEAR. B) MEETING SETUP TIME REQUIREMENTS WOULD BE DIFFICULT. C) PROBABLY WOULD NOT EXPAND THE S-530 WHEN DEPLOYED. D) ONE S-530 WOULD PROBABLY BE DEPLOYED BY 2 1/2 TON. E) NO METHOD TO PLUG IN ECU ON OUTSIDE OF SHELTER. F) ALL OF S-530'S HAVE BEEN PICKED UP BY WRECKER. TOP LIFT WAS USED. G) ERECTION PINS SHOULD HAVE SOME ADDITIONAL SLOP TO AID IN ERECTION.	
38	A) THERE IS SOME CONCERN AS TO HOW WELL THE S-530 SHELTERS WILL MARRY TOGETHER ON UNEVEN TERRAIN WITHOUT TWISTING OR DISTORTING THE SHELTER MOVABLE WALLS.	
43	A) NO ECU. SHELTER GETS VERY HOT.	
46	A) THE SHELTER EXCEEDS THE WEIGHT LIMITATIONS OF THE XM720 MOBILIZER.	

TABLE
GENERAL COMMENTS
S-530

IDENT NO.	GENERAL COMMENT
50	A) SHELTERS NEED ENVIRONMENTAL CONTROL. B) ACCEPTANCE DATE 3/80. EQUIPMENT SHIPPED TO KADENA 2/81.
48	A) TOO SMALL.
49	A) ACCEPTANCE DATE 2/80. B) PERSONNEL ON ROOF GIVEN AT 25. ASSUMED THIS WAS TOTAL AND NOT AT ONE TIME.
63	A) ACCEPTANCE DATE 12/79.

TABLE
RELIABILITY COMMENTS
S-530

IDENT NO.	RELIABILITY COMMENT
3	A) RF GASKET LOOSE AT BOTTOM OF DOOR.
2	A) WELDS BREAK ON STRUT USED TO SHIFT SHELTER FOR ALIGNMENT.
11	A) POOR SEALING OF JOINTS AND RIVITS.
19	A) BALLAST HAS A HIGH FAILURE RATE AND REPLACEMENT COST IS HIGH. B) SUPPLY SUPPORT IS INADEQUATE FOR MOST REPLACEMENT PARTS.
26	A) ROOF LEAKS WHERE SHELTERS JOIN.
31	A) IF S-530 IS MOUNTED ON SM-720 AND EXPANDED, THE WALL BOWS. SHOULD MADE SURE THAT THE WALL IS STENGHTENED IF THEY ARE GOING TO MOBOLIZE BY XM-270. B) S-530 WEATHER SEAL IS VERY FRAGILE. C) STOW BRACKET FOR LIFTING ASSY PULLED LOOSE. RIVNUT ON OUTSIDE MISSING. THE RIVNUT WAS LOOSE. DAMAGED IN TRANSIT TO UNIT.
34	A) RF SHIELDING ON ONE SHELTER COME LOOSE AND IS STRETCHED. B) MUST EXERT CONSIDERABLE FORCE ON DOOR HANDLE TO LATCH HANDLE. C) INPUT POWER SELECT SWITCH DIFFICULT TO ACTUATE.
36	A) WATER INTRUSTION THRU SIDE SEAM ONTO FLOOR WHEN ERECTED. COULD BE BECAUSE NOT PERFECTLY LEVEL. B) CORROSION ON ANODIZED ALUMINUM ON CEILING AT SEAM ON EXPANDED PORTION. C) RIVNUTS POPOUT QUITE EASILY. D) VOLTAGE VARIES WHEN CIRCUIT BREAKERS ARE TURNED ON/OFF EVEN WITH NO LOAD ON CIRCUIT. E) BALLAST FAILS FREQUENTLY.

TABLE
RELIABILITY COMMENT
S-530

IDENT NO.	RELIABILITY COMMENT
46	A) PROBLEMS HAVE BEEN ENCOUNTERED WHEN EXPANDING THE SHELTER INTO A TWO SHELTER CONFIGURATION. WHEN TIGHTENING THE HOLD-DOWN BRACKET FOR THE PANELS, THE BRACKET STARTS TO COME OUT OF THE WALL.
49	A) WATER INTRUSTION. B) WEAK WELD ON SPREADER BAR.

Appendix E
Terminal Point Questionnaire Forms

LCTP
Questionnaire

Location TRAVIS AFB, CA/AERIAL PORT Interviewer R. McGowan
Transport Type C-5A/C-141/C-130/CRAET Interviewee Mr. George J. Volcar
Date 22 DEC 80 Title and Phone No. AV 837-3377/3206

1. What method(s) of transport and used to ship shelters to/from this location: Truck y, trailer y, mobilizer , pallet , ship , aircraft , railroad , other ? Describe other and any combinations
2. Does the method differ if incoming/outgoing from different geographical locations? NO If yes, how?
3. Is there any "typical" damage observed with these methods of transport? NO
If yes, list method of transport and describe damage
4. What method(s) are used to unload/load the shelters from/to the transport used to ship the shelters to/from this location: Crane x, forklift x, wrecker , kit , other ? Describe kit, other, type of forklift, length of sling, etc.
5. Is there any "typical" damage observed with these methods of unload/load? NO
If yes, list method and describe damage
6. What method(s) are used to move shelters about the loading area: Crane , forklift , wrecker , truck , trailer , mobilizer , other ? Describe other, type of forklift, length of sling, etc.
Shelters that can be palletized (463L 88" X 108" Pallet) are transported on
aircraft loading vehicles. Wheeled shelters are towed.
7. Is there any "typical" damage observed with these methods? NO
If yes, list method and describe damage

17. Are shelters shipped on pallets? YES If yes, what pallet? 463L 88" X 108"
How are they loaded/unloaded from the pallet? Forklift X, crane X,
wrecker _____, kit _____, other _____? Describe kit, other,
type of forklift, length of sling, etc. 10,000 cap forklift or 35 ton
bridge crane.
18. Is there any "typical" damage observed with these methods of loading/unloading?
NO If yes, list method and describe damage _____
19. Are any types of prepackaging precautions taken: Desiccants _____, padding _____,
greasing joints and hinges _____, sealing doors and openings _____, other _____?
If yes, describe methods. None except to use spreader bars when hoisting
with crane and insure forklift tines are long enough not to damage underside of
shelters.
20. Are the prepackaging precautions effective? YES If not, list precaution and
problem. If yes, is there any specific instance(s) where the precaution
prevented damage? _____ If yes, describe. _____
21. Is there any shipping damage inspections performed? YES If yes, how is it
documented and what is documented? Detected damage - if any - is
annotated on DD form 6
22. Has any of the methods described above changed in the recent past? NO
If yes, what changed and how? _____
23. Do you expect any of the methods to change in the future? NO If yes, how? _____

24. Are data available on where equipments are shipped? YES If yes, are data available by equipment nomenclature (ex. AN/TPN-19)? NO If either answer is yes, how can we obtain data? Data available can be obtained thru TCN inquiry.
-
-

25. Are data available on how often equipments are received/shipped? YES If yes, are data available by equipment nomenclature? NO If either answer is yes, how can we obtain data?
-

Data can be obtained by TCN inquiry only.

MOST OF THESE QUESTIONS ARE NOT ANSWERABLE FROM
A LOADMASTER STANDPOINT. THESE
QUESTIONS ARE SHIPPER/AERIAL LCTP
PORT PARTICULAR FUNCTIONS. Questionnaire

Location TRAVIS AFB, CA Interviewer R. McGowan
Transport Type C-5A Interviewee SMSGT D.J. BRITTAIN
Date 22DEC90 Title and Phone No. Chief CSLM 22AF 837-2848

1. What method(s) of transport and used to ship shelters to/from this location:
Truck____, trailer____, mobilizer____, pallet____, ship____, aircraft____,
railroad____, other____? Describe other and any combinations_____

2. Does the method differ if incoming/outgoing from different geographical
locations?____ If yes, how?_____

3. Is there any "typical" damage observed with these methods of transport?_____
If yes, list method of transport and describe damage_____

4. What method(s) are used to unload/load the shelters from/to the transport used
to ship the shelters to/from this location: Crane____, forklift____,
wrecker____, kit____, other____? Describe kit, other, type of forklift,
length of sling, etc._____

5. Is there any "typical" damage observed with these methods of unload/load?_____
If yes, list method and describe damage_____

6. What method(s) are used to move shelters about the loading area: Crane____,
forklift____, wrecker____, truck____, trailer____, mobilizer____, other____
____? Describe other, type of forklift, length of sling, etc._____

7. Is there any "typical" damage observed with these methods?_____
If yes, list method and describe damage_____

8. How are shelters loaded/unloaded to/from the transport (ship, aircraft):
Crane , forklift , kit , wrecker , other x? Describe
kit, other, type of forklift, length of sling, etc. 4361 Loading Equipment
9. Are shelters shipped on-deck and/or below deck ?
10. Are containers used in shipment ? If yes, describe.
11. How are shelters moved about on the ship: Forklift , crane , other ?
Describe other, type of forklift, length of sling, etc.
12. Is there any "typical" damage observed with these methods? If yes, list
method and describe damage.
13. Is cargo area pressurized? YES If yes, do you have an estimate of how often
pressure is lost in flight? NO
14. How are shelters tied down when loaded? Chains and Devices using the
following restrain criteria: 65-36/s FWD, 1.5 G's AFT, 1.5G's Lateral, 2 vertical.
15. Is there any "typical" damage observed with these methods? no If yes, list
method and describe damage.
16. Are shelters shipped with mobilizer attached? yes If yes, what type mobilizer?
 Is there any "typical" damage observed with this method
of shipment? If yes, list mobilizer and describe damage.

17. Are shelters shipped on pallets? ^{at} times If yes, what pallet? 463L Master Pallets
How are they loaded/unloaded from the pallet: Forklift , crane ,
wrecker , kit , other X ? Describe kit, other,
type of forklift, length of sling, etc. 463L Loading Equipment.
18. Is there any "typical" damage observed with these methods of loading/unloading?
NO If yes, list method and describe damage
19. Are any types of prepackaging precautions taken: Desiccants , padding ,
greasing joints and hinges , sealing doors and openings , other ?
If yes, describe methods.
20. Are the prepackaging precautions effective? If not, list precaution and
problem. If yes, is there any specific instance(s) where the precaution
prevented damage? If yes, describe.
21. Is there any shipping damage inspections performed? If yes, how is it
documented and what is documented?
22. Has any of the methods described above changed in the recent past?
If yes, what changed and how?
23. Do you expect any of the methods to change in the future? If yes, how?

24. Are data available on where equipments are shipped? _____ If yes, are data available by equipment nomenclature (ex. AN/TPN-19)? _____ If either answer is yes, how can we obtain data? _____

25. Are data available on how often equipments are received/shipped? _____ If yes, are data available by equipment nomenclature? _____ If either answer is yes, how can we obtain data? _____

LCTP
Questionnaire

Location TRAVIS AFB, CA Interviewer SMSGT MAITSON
Transport Type C-141 Interviewee SMSGT MAITSON
Date 23 DEC 80 Title and Phone No. Chief Land master 22 AF/2840

1. What method(s) of transport and used to ship shelters to/from this location: Truck____, trailer____, mobilizer____, pallet____, ship____, aircraft____, railroad____, other____? Describe other and any combinations_____

2. Does the method differ if incoming/outgoing from different geographical locations?____ If yes, how?_____

3. Is there any "typical" damage observed with these methods of transport?____
If yes, list method of transport and describe damage_____

4. What method(s) are used to unload/load the shelters from/to the transport used to ship the shelters to/from this location: Crane____, forklift____, wrecker____, kit____, other____? Describe kit, other, type of forklift, length of sling, etc._____

5. Is there any "typical" damage observed with these methods of unload/load?____
If yes, list method and describe damage._____

6. What method(s) are used to move shelters about the loading area: Crane____, forklift____, wrecker____, truck____, trailer____, mobilizer____, other____? Describe other, type of forklift, length of sling, etc._____

7. Is there any "typical" damage observed with these methods?____
If yes, list method and describe damage._____

8. How are shelters loaded/unloaded to/from the transport (ship, aircraft):
Crane _____, forklift _____, kit _____, wrecker _____, other X ? Describe
kit, other, type of forklift, length of sling, etc. 463L Equipment
9. Are shelters shipped on deck _____ and/or below deck _____?
10. Are containers used in shipment _____? If yes, describe. _____
11. How are shelters moved about on the ship: Forklift _____, crane _____, other _____?
Describe other, type of forklift, length of sling, etc. _____
12. Is there any "typical" damage observed with these methods? _____ If yes, list
method and describe damage. _____
13. Is cargo area pressurized? YES If yes, do you have an estimate of how often
pressure is lost in flight? Very seldom-less than .50%
14. How are shelters tied down when loaded? Secured with chains and devices to
appropriate rated fittings aboard the aircraft.
15. Is there any "typical" damage observed with these methods? NO If yes, list
method and describe damage. _____
16. Are shelters shipped with mobilizer attached? _____ If yes, what type mobilizer?
_____ Is there any "typical" damage observed with this method
of shipment? _____ If yes, list mobilizer and describe damage. _____

17. Are shelters shipped on pallets? yes If yes, what pallet? 4631
How are they loaded/unloaded from the pallet: Forklift X, crane _____,
wrecker _____, kit _____, other _____? Describe kit, other,
type of forklift, length of sling, etc. _____

18. Is there any "typical" damage observed with these methods of loading/unloading?
NO If yes, list method and describe damage _____

19. Are any types of prepackaging precautions taken: Desiccants _____, padding _____,
greasing joints and hinges _____, sealing doors and openings _____, other _____?
If yes, describe methods. _____

20. Are the prepackaging precautions effective? _____. If not, list precaution and
problem. If yes, is there any specific instance(s) where the precaution
prevented damage? _____ If yes, describe. _____

21. Is there any shipping damage inspections performed? _____ If yes, how is it
documented and what is documented? _____

22. Has any of the methods described above changed in the recent past? _____
If yes, what changed and how? _____

23. Do you expect any of the methods to change in the future? _____ If yes, how?

24. Are data available on where equipments are shipped? _____ If yes, are data available by equipment nomenclature (ex. AN/TPN-19)? _____ If either answer is yes, how can we obtain data? _____

25. Are data available on how often equipments are received/shipped? _____ If yes, are data available by equipment nomenclature? _____ If either answer is yes, how can we obtain data? _____

LCIF
Questionnaire

Location OAKLAND ARMY TERMINAL Interviewer _____
Transport Type WATER/CONTAINER Interviewee Nathan Glover
Date 12 DEC 80 Title and Phone No. Deputy Cargo Operations Br.

1. What method(s) of transport and used to ship shelters to/from this location:
Truck X, trailer X, mobilizer _____, pallet X, ship X, aircraft _____,
railroad _____, other _____? Describe other and any combinations Container

2. Does the method differ if incoming/outgoing from different geographical
locations? NO If yes, how? _____

3. Is there any "typical" damage observed with these methods of transport? NO
If yes, list method of transport and describe damage _____

4. What method(s) are used to unload/load the shelters from/to the transport used
to ship the shelters to/from this location: Crane X, forklift X,
wrecker X, kit _____, other _____? Describe kit, other, type of forklift,
length of sling, etc. Forklift used depends on size weight and configuration
of the cargo

5. Is there any "typical" damage observed with these methods of unload/load? NO
If yes, list method and describe damage. _____

6. What method(s) are used to move shelters about the loading area: Crane X,
forklift X, wrecker X, truck X, trailer X, mobilizer _____, other
_____.? Describe other, type of forklift, length of sling, etc. _____

7. Is there any "typical" damage observed with these methods? NO
If yes, list method and describe damage. _____

8. How are shelters loaded/unloaded to/from the transport (ship, aircraft):
Crane X, forklift , kit , wrecker , other ? Describe
kit, other, type of forklift, length of sling, etc. Ships gear-spreader
bars and slings depending on size weight.
9. Are shelters shipped on-deck NO and/or below deck YES?
10. Are containers used in shipment YES? If yes, describe
Size and weight determines usage.
11. How are shelters moved about on the ship: Forklift X, crane , other ?
Describe other, type of forklift, length of sling, etc.
Size and weight determine forklift and sling type and size.
12. Is there any "typical" damage observed with these methods? NO If yes, list
method and describe damage.
13. Is cargo area pressurized? N/A If yes, do you have an estimate of how often
pressure is lost in flight?
14. How are shelters tied down when loaded? Padeyes are used and metal straps,
wire rope or chain is used for securing. Weight and size will be the determiner
15. Is there any "typical" damage observed with these methods? NO If yes, list
method and describe damage.
16. Are shelters shipped with mobilizer attached? N/A If yes, what type mobilizer?
 Is there any "typical" damage observed with this method
of shipment? If yes, list mobilizer and describe damage.

17. Are shelters shipped on pallets? yes If yes, what pallet? _____
How are they loaded/unloaded from the pallet: Forklift X, crane X,
wrecker _____, kit _____, other _____? Describe kit, other,
type of forklift, length of sling, etc. _____
Depends on size, weight and dimensions.
18. Is there any "typical" damage observed with these methods of loading/unloading?
NO If yes, list method and describe damage _____
19. Are any types of prepackaging precautions taken: Desiccants _____, padding _____,
greasing joints and hinges _____, sealing doors and openings _____, other _____?
If yes, describe methods. _____
N/A
20. Are the prepackaging precautions effective? _____ If not, list precaution and
problem. If yes, is there any specific instance(s) where the precaution
prevented damage? _____ If yes, describe. _____
N/A
21. Is there any shipping damage inspections performed? yes If yes, how is it
documented and what is documented? _____
Normal inspection by terminal and clerical shipping clerks on inspections
22. Has any of the methods described above changed in the recent past? NO
If yes, what changed and how? _____
23. Do you expect any of the methods to change in the future? NO If yes, how? _____

24. Are data available on where equipments are shipped? _____ If yes, are data available by equipment nomenclature (ex. AN/TPN-19)? _____ If either answer is yes, how can we obtain data? No records Maintained
-
-

25. Are data available on how often equipments are received/shipped? _____ If yes, are data available by equipment nomenclature? _____ If either answer is yes, how can we obtain data? No records maintained
-
-
-

LCTP
Questionnaire

Location OAKLAND ARMY BASE, CA Interviewer _____
Transport Type OCEAN Interviewer Mr. M. J. Howerton
Date 17 DEC 80 Title and Phone No. Chief, USAF Water Port AV 864-2011
Logistics Office (APLC)

1. What method(s) of transport and used to ship shelters to/from this location:
Truck x, trailer _____, mobilizer _____, pallet _____, ship x, aircraft _____,
railroad x, other _____? Describe other and any combinations _____

2. Does the method differ if incoming/outgoing from different geographical
locations? NO If yes, how? _____

3. Is there any "typical" damage observed with these methods of transport? YES
If yes, list method of transport and describe damage Damage in rail movement
if equipment in shelter not properly blocked and braced.

4. What method(s) are used to unload/load the shelters from/to the transport used
to ship the shelters to/from this location: Crane x, forklift _____,
wrecker _____, kit _____, other x? Describe kit, other, type of forklift,
length of sling, etc. Shins Gear.

5. Is there any "typical" damage observed with these methods of unload/load? NO
If yes, list method and describe damage. _____

6. What method(s) are used to move shelters about the loading area: Crane x,
forklift _____, wrecker _____, truck _____, trailer x, mobilizer _____, other
_____.? Describe other, type of forklift, length of sling, etc. _____

7. Is there any "typical" damage observed with these methods? NO
If yes, list method and describe damage. _____

8. How are shelters loaded/unloaded to/from the transport (ship, aircraft):
Crane X, forklift , kit , wrecker , other X? Describe
kit, other, type of forklift, length of sling, etc.
Ship's Gear.
9. Are shelters shipped on-deck X and/or below deck X?
10. Are containers used in shipment NO? If yes, describe.
11. How are shelters moved about on the ship: Forklift X, crane X, other ?
Describe other, type of forklift, length of sling, etc.
12. Is there any "typical" damage observed with these methods? NO If yes, list
method and describe damage.
13. Is cargo area pressurized? NO If yes, do you have an estimate of how often
pressure is lost, in-flight?
14. How are shelters tied down when loaded? Steel cable or chain.
15. Is there any "typical" damage observed with these methods? NO If yes, list
method and describe damage.
16. Are shelters shipped with mobilizer attached? no If yes, what type mobilizer?
 Is there any "typical" damage observed with this method
of shipment? If yes, list mobilizer and describe damage.

17. Are shelters shipped on pallets? no If yes, what pallet? _____
How are they loaded/unloaded from the pallet: Forklift _____, Crane _____,
wrecker _____, kit _____, other _____? Describe kit, other,
type of forklift, length of sling, etc. _____

18. Is there any "typical" damage observed with these methods of loading/unloading?
_____ If yes, list method and describe damage _____

19. Are any types of prepackaging precautions taken: Desiccants _____, padding _____,
greasing joints and hinges _____, sealing doors and openings X, other _____?
If yes, describe methods. _____ Insure equipment inside shelters are properly
blocked and braced. _____

20. Are the prepackaging precautions effective? UNK. If not, list precaution and
problem. If yes, is there any specific instance(s) where the precaution
prevented damage? _____ If yes, describe. _____

21. Is there any shipping damage inspections performed? YES If yes, how is it
documented and what is documented? _____
Documented by Post Officials on standard form 363 (DISCON) _____

22. Has any of the methods described above changed in the recent past? no
If yes, what changed and how? _____

23. Do you expect any of the methods to change in the future? no If yes, how? _____

24. Are data available on where equipments are shipped? YES If yes, are data available by equipment nomenclature (ex. AN/TPN-19)? If either answer is yes, how can we obtain data? Available on current shipments at the Military Ocean Terminal Bary Area, Oakland Army Base, CA. Data can be obtained by letter.
-
-

25. Are data available on how often equipments are received/shipped? NO If yes, are data available by equipment nomenclature? If either answer is yes, how can we obtain data?
-
-
-
-

LCTP
Questionnaire

Location SEALAND SERVICES Inc. Interviewer R. McGowan
Transport Type ISO CONTAINER Interviewee James Vidette
Date 12/11/80 Title and Phone No. Sr. Acctg Exec.
(415) 271-1173/74

1. What method(s) of transport and used to ship shelters to/from this location: Truck X, trailer____, mobilizer____, pallet____, ship X, aircraft____, railroad____, other____? Describe other and any combinations other modes depending on point of origin.
2. Does the method differ if incoming/outgoing from different geographical locations? YES If yes, how? SOMETIMES
3. Is there any "typical" damage observed with these methods of transport? NO If yes, list method of transport and describe damage Can't open containers (Shipper Packed)
4. What method(s) are used to unload/load the shelters from/to the transport used to ship the shelters to/from this location: Crane X, forklift____, wrecker____, kit____, other____? Describe kit, other, type of forklift, length of sling, etc. Don't load/unload "shelters"
5. Is there any "typical" damage observed with these methods of unload/load? NO If yes, list method and describe damage_____
6. What method(s) are used to move shelters about the loading area: Crane X, forklift____, wrecker____, truck X, trailer____, mobilizer____, other____? Describe other, type of forklift, length of sling, etc._____
7. Is there any "typical" damage observed with these methods? NO If yes, list method and describe damage_____

8. How are shelters loaded/unloaded to/from the transport (ship, aircraft):
Crane X, forklift _____, kit _____, wrecker _____, other _____? scribe
kit, other, type of forklift, length of sling, etc. _____
9. Are shelters shipped on-deck YES and/or below deck YES? CONTAINER ARE-
10. Are containers used in shipment YES? If yes, describe. ISO 20', 40'
11. How are shelters moved about on the ship: Forklift _____, crane X, other _____?
Describe other, type of forklift, length of sling, etc. _____
12. Is there any "typical" damage observed with these methods? NO If yes, list
method and describe damage. _____
13. Is cargo area pressurized? _____ If yes, do you have an estimate of how often
pressure is lost in flight? _____
N/A
14. How are shelters tied down when loaded? YES "ISO SYSTEM" ON BOARD SHIP
15. Is there any "typical" damage observed with these methods? NO If yes, list
method and describe damage. _____
16. Are shelters shipped with mobilizer attached? UNK If yes, what type mobilizer?
_____ Is there any "typical" damage observed with this method
of shipment? _____ If yes, list mobilizer and describe damage.

17. Are shelters shipped on pallets? NO If yes, what pallet? _____
How are they loaded/unloaded from the pallet? Forklift _____, crane _____,
wrecker _____, kit _____, other _____? Describe kit, other,
type of forklift, length of sling, etc. Some shipments are made via sealand
flat bed trailers. Could not remember per-se if shelters were handled this way.
18. Is there any "typical" damage observed with these methods of loading/unloading?
NO If yes, list method and describe damage _____
19. Are any types of prepackaging precautions taken: Desiccants _____, padding _____,
greasing joints and hinges _____, sealing doors and openings _____, other _____?
If yes, describe methods. UNK.
20. Are the prepackaging precautions effective? UNK. If not, list precaution and
problem. If yes, is there any specific instance(s) where the precaution
prevented damage? _____ If yes, describe _____
21. Is there any shipping damage inspections performed? YES If yes, how is it
documented and what is documented? Only if a claim is filed - (DD form 6)
etc. (Company Reports)
22. Has any of the methods described above changed in the recent past? NO
If yes, what changed and how? _____
23. Do you expect any of the methods to change in the future? NO If yes, how? _____

24. Are data available on where equipments are shipped? no If yes, are data available by equipment nomenclature (ex. AN/TPN-19)? If either answer is yes, how can we obtain data? All military shipments are what is called "Shipper Packed/Sealed"
-
-

25. Are data available on how often equipments are received/shipped? NO If yes, are data available by equipment nomenclature? If either answer is yes, how can we obtain data?
-
-
-

NOTE:-

(McTallan is setting up turn-around point for ISO/containers (depot) status unknown could be something to look into later.)

LCTP
Questionnaire

Location SM/ALC VAN REPAIR ACT Interviewer R. McGowan
Transport Type N/A (Repair Depot) Interviewee (Briefing
Date 10 Dec 80 Title and Phone No. Shop Foreman 633-UNK

1. What method(s) of transport and used to ship shelters to/from this location: Truck x, trailer , mobilizer x, pallet , ship , aircraft , railroad , other x? Describe other and any combinations Shipment to the repair section is handled by transportation section to the repair facility get them by flatbed or fork lift.
2. Does the method differ if incoming/outgoing from different geographical locations? UNK If yes, how? Will need to check this via telcom
3. Is there any "typical" damage observed with these methods of transport? NO If yes, list method of transport and describe damage
4. What method(s) are used to unload/load the shelters from/to the transport used to ship the shelters to/from this location: Crane , forklift x, wrecker , kit , other ? Describe kit, other, type of forklift, length of sling, etc.
5. Is there any "typical" damage observed with these methods of unload/load? No If yes, list method and describe damage
6. What method(s) are used to move shelters about the loading area: Crane , forklift x, wrecker , truck , trailer , mobilizer , other ? Describe other, type of forklift, length of sling, etc. 10K STD Military Forklift various Mfg.
7. Is there any "typical" damage observed with these methods? No - Note - If yes, list method and describe damage. At the point all shelters are checked for damage, delamination & corrosion via tapping, Eddy current Mtr, etc. Damage would be noted if occurred in shipment from attached forms etc (DD form 5)

8. How are shelters loaded/unloaded to/from the transport (Trucked to Transportation) Crane____, forklift X, kit____, wrecker____, other____? Describe kit, other, type of forklift, length of sling, etc. _____

9. Are shelters shipped on-deck N/A and/or below deck____?

10. Are containers used in shipment Yes? If yes, describe ESD, crated, etc. Depending on destination and or other instructions. _____

11. How are shelters moved about on the ship: Forklift N/A, crane____, other____? Describe other, type of forklift, length of sling, etc. _____

12. Is there any "typical" damage observed with these methods? N/A If yes, list method and describe damage. _____

13. Is cargo area pressurized? N/A If yes, do you have an estimate of how often pressure is lost in flight? _____

14. How are shelters tied down when loaded? Not usual for short distance. _____

15. Is there any "typical" damage observed with these methods? No If yes, list method and describe damage. _____

16. Are shelters shipped with mobilizer attached? yes If yes, what type mobilizer? VARIOUS Is there any "typical" damage observed with this method of shipment? NO If yes, list mobilizer and describe damage. They also repair Mobilizers at this location. _____

17. Are shelters shipped on pallets? UNK If yes, what pallet? _____
How are they loaded/unloaded from the pallet: Forklift _____, crane _____,
wrecker _____, kit _____, other _____? Describe kit, other,
type of forklift, length of sling, etc. _____

18. Is there any "typical" damage observed with these methods of loading/unloading?
_____ If yes, list method and describe damage _____

19. Are any types of prepackaging precautions taken: Desiccants _____, padding _____,
greasing joints and hinges _____, sealing doors and openings _____, other _____?
If yes, describe methods. _____ UNK

20. Are the prepackaging precautions effective? UNK. If not, list precaution and
problem. If yes, is there any specific instance(s) where the precaution
prevented damage? _____ If yes, describe _____

21. Is there any shipping damage inspections performed? YES If yes, how is it
documented and what is documented? (DD 6) & Depot reports

22. Has any of the methods described above changed in the recent past? NO
If yes, what changed and how? _____

23. Do you expect any of the methods to change in the future? NO If yes, how?
Possible if the new shelters are different.

24. Are data available on where equipments are shipped? no If yes, are data available by equipment nomenclature (ex. AN/TPN-19)? If either answer is yes, how can we obtain data? Not at repair site Mgt section, records man Hqs and converts to charges, etc.
-
-

25. Are data available on how often equipments are received/shipped? + If yes, are data available by equipment nomenclature? If either answer is yes, how can we obtain data? Need to check on this.
-
-
-

NOTES:

Points that some future problems may be induced by how paints are removed was addressed.

1. Army Removes Paint By Sand Blast
2. Air Force Chemical Bath (Shower)
3. Navy I Believe Sand Blast

They don't think railroad cars are used as prime shipping method.

Appendix F
SAMPLE
SURVEY QUESTIONNAIRE
FORMS

LEAST COST TEST PROFILE

We are attempting to develop a Least Cost Test methodology for shelters which would be based on the anticipated use of the shelter. The Air Force currently purchases a tactical system which is comprised of the electronic equipment and the shelter; therefore, the anticipated use of the shelter is determined by the anticipated use of the electronic equipment.

Currently a full set of tests are imposed on a shelter. These tests are structured to duplicate the operational life. The object of the tests being to determine if the shelter is qualified to meet these conditions. The tests currently imposed are based on the premise that the shelter may be deployed anywhere in the world and may be transported by any certified method across the whole gamut of terrains or conditions. This test strategy is costly. We are attempting to ascertain whether the full set of tests are required for every shelter procurement or if the test selection can be tailored based on equipment function. In addition, we are attempting to determine if the current set of tests do duplicate actual service conditions.

We intend to use the current and expected operational life profiles as an estimator of the anticipated use.

The operational life profile is nothing more than the complete set of individual mission profiles where a mission profile is a description of a specific activity that exercises or stresses the shelter--not the electronic equipment. We need the mission profiles by equipment nomenclature so that we can determine if operational life profiles are a function of electronic equipment function (e.g., navigational radar, fire control radar, search radar, communications central, communications relay, etc.).

To determine if the current set of tests do, in fact, duplicate actual service conditions, we need to know what the actual service conditions are and if any damage routinely occurs during a specific operation.

The survey is structured to ascertain two facts: the actual use conditions imposed on tactical system, and the actual service conditions and any damage that routinely occurs during a specific operation. These facts will be used to determine anticipated use by equipment function, and the adequacy of existing methods and conditions.

ORGANIZATION _____

DATE _____

PERSONNEL RESPONSIBLE FOR QUESTIONNAIRE:

NAME/RANK _____

TITLE _____

NAME/RANK _____

TITLE _____

TELEPHONE NO _____

AUTOVON _____

INSTRUCTIONS:

- (1) PLEASE REFER TO ENCLOSED EXAMPLE.
- (2) FILL IN EQUIPMENT TYPE ASSIGNED TO YOUR ORGANIZATION.
- (3) FILL IN SYSTEM TYPE, ie, 407L, 433L, etc.
- (4) ANSWER AND FILL IN ALL APPLICABLE BLOCKS.
- (5) COMMENTS. PLEASE REFER ANY ADDITIONAL COMMENTS TO A SPECIFIC EQUIPMENT/SHELTER TYPE.
- (6) PLEASE MAIL COMPLETED QUESTIONNAIRE TO:

MR. JAMES P. CAREY, JR.
RADG/RBRAC
RELIABILITY ANALYSIS CENTER
GRIFFISS AFB, NY 13441

COMMENTS:

SYSTEM TYPE

1. QTY of Equipment At This Location
2. Shelter Nomenclature
3. Year(s) Shelters were manufactured (Acceptance date if on AFN 95 form)
4. How long has this equipment been at this base?
5. How long have you been at this base?
6. How many times has this shelter been sent to depot for repair/rehabilitation?
7. Is shelter ever dropped from a helicopter?
 - a) How far is it dropped (feet)?
 - b) How often is it moved by helicopter (per year)?
8. How many times have these shelters been accidentally dropped?
 - a) How far (feet) was it dropped?
9. Is shelter ever shipped/deployed by train?
 - c) How many times/year?
10. How many times/year is equipment setup/torn down at night?
11. How often is equipment setup on jacks (per year)?
 - a) Is it ever moved on jacks? If yes explain why in comments.
12. How often is equipment setup on uneven terrain (per year)?
 - a) estimate maximum difference in elevation side-to-side (feet)
 - b) estimate maximum difference in elevation front-to-back (feet)
13. How many days/year is equipment operated at the home station?
 - a) How many hours/day (average) is it operated?
14. How often (per year) is equipment setup at Home Station?
15. How often (per year) is equipment torn down at Home Station?
16. Is shelter functionally adequate? If no, explain why in comments
17. Have any problems been experienced in shelters? If yes, describe in comment
18. Are there any areas of concern with the shelter? If yes, describe in comment
19. How many times is shelter deployed/year?
 - a) Mobilizing method & frequency
 - b) Type of transport & frequency
 - c) Tiedown method on mobilizer/transport
 - d) Loading/unloading method(s) from mobilizer/transport
 - e) Aircraft type & frequency
 - f) Duration of deployment (days)
 - g) Miles mobilized over paved roads/deployment
 - h) Miles mobilized over unpaved roads/deployment
 - i) Where deployed and season of year
20. Estimate number of people ever on roof (nominal/maximum)
Describe reason for people on roof in comments
21. Estimate number of times door opened/day?

LCTP
Questionnaire

Location _____ Interviewer _____
Transport Type _____ Interviewer _____
Date _____ Title and Phone No. _____

1. What method(s) of transport and used to ship shelters to/from this location: Truck _____, trailer _____, mobilizer _____, pallet _____, ship _____, aircraft _____, railroad _____, other _____? Describe other and any combinations _____

2. Does the method differ if incoming/outgoing from different geographical locations? _____ If yes, how? _____

3. Is there any "typical" damage observed with these methods of transport? _____
If yes, list method of transport and describe damage _____

4. What method(s) are used to unload/load the shelters from/to the transport used to ship the shelters to/from this location: Crane _____, forklift _____, wrecker _____, kit _____, other _____? Describe kit, other, type of forklift, length of sling, etc. _____

5. Is there any "typical" damage observed with these methods of unload/load? _____
If yes, list method and describe damage. _____

6. What method(s) are used to move shelters about the loading area: Crane _____, forklift _____, wrecker _____, truck _____, trailer _____? (mobilizer _____, other) _____? Describe other, type of forklift, length of sling, etc. _____

7. Is there any "typical" damage observed with these methods? _____
If yes, list method and describe damage. _____

8. How are shelters loaded/unloaded to/from the transport (ship, aircraft):
Crane____, forklift____, kit____, wrecker____, other____? Describe
kit, other, type of forklift, length of sling, etc. _____

9. Are shelters shipped on-deck____ and/or below deck____?
10. Are containers used in shipment____? If yes, describe. _____

11. How are shelters moved about on the ship: forklift____, crane____, other____?
Describe other, type of forklift, length of sling, etc. _____

12. Is there any "typical" damage observed with these methods?____ If yes, list
method and describe damage. _____

13. Is cargo area pressurized?____ If yes, do you have an estimate of how often
pressure is lost in flight? _____

14. How are shelters tied down when loaded? _____

15. Is there any "typical" damage observed with these methods?____ If yes, list
method and describe damage. _____

16. Are shelters shipped with mobilizer attached?____ If yes, what type mobilizer?
_____. Is there any "typical" damage observed with this method
of shipment?____ If yes, list mobilizer and describe damage. _____

17. Are shelters shipped on pallets? _____ If yes, what pallet? _____
How are they loaded/unloaded from the pallet: Forklift _____, crane _____,
wrecker _____, kit _____, other _____? Describe kit, other,
type of forklift, length of sling, etc. _____

18. Is there any "typical" damage observed with these methods of loading/unloading?
_____ If yes, list method and describe damage _____

19. Are any types of prepackaging precautions taken: desiccants _____, padding _____,
greasing joints and hinges _____, sealing doors and openings _____, other _____?
If yes, describe methods. _____

20. Are the prepackaging precautions effective? _____. If not, list precaution and
problem. If yes, is there any specific instance(s) where the precaution
prevented damage? _____ If yes, describe. _____

21. Is there any shipping damage inspections performed? _____ If yes, how is it
documented and what is documented? _____

22. Has any of the methods described above changed in the recent past? _____
If yes, what changed and how? _____

23. Do you expect any of the methods to change in the future? _____ If yes, how?

24. Are data available on where equipments are shipped? _____ If yes, are data available by equipment nomenclature (ex. AN/TPN-19)? _____ If either answer is yes, how can we obtain data? _____

25. Are data available on how often equipments are received/shipped? _____ If yes, are data available by equipment nomenclature? _____ If either answer is yes, how can we obtain data? _____

Appendix G
General Shelter
Data/Information
Summaries

REPORT TITLE AND IDENTIFICATION NUMBER

TITLE

RPT NO.

- 1 Product Improvement Test of Radio Terminal Sets AN/TRC-117/151 and AN/TRC-145, Final Report, CPT. Paul T. Pashia, May, 1977, TECOM PROJECT NO: ADB018917 6-EE-TRC-117-005, Publication NO: USAEPG-FR-922.
- 2 IMPROVED SHELTERS, Major K.W. Allen, Final Report, December, 1975, MASTER TEST REPORT NO. FM 301, ADB008922.
- 3 Product Improvement Test of Tropospheric Scatter Tactical Communications System AN/TRC-172, Final Report, D.W. Wykes, August, 1979, TECOM Project NO. 6-EE-TRC-172-001, Publication NO: USAEPG-FR-1071, ADB040490.
- 4 Operational Test II of One Side Expandable 8'X8'X20' Rigid Wall Shelter, Final Report, 2 LT. W. James Beattie, SSG Jeffrey K. Connors, SSG Thomas R. King, 14 March 1980.
- 5 50 - foot Expandable 150 shelter, Capt. C.L. Alexander, Final Report, September 1976, TCATA Test Report NO: FM 302, ADB013617.
- 6 OT II Test of Terminal, Tactical Satellite Communications, AN/MS-59, 1/4- Ton Trailer Mounted and AN/TSC-85 (V1/V2), 1 1/4- Ton Truck Mounted. Capt. L.G. Russell, December 1975.
- 7 Inspection Comparison Test for Dolly Set, Transportable Shelter, 3-Ton, M720, W.R. Stevens May 1979.
- 8 Product Improvement Test of Shelter, Electrical Equipment S-280 B/G, July 1979.
- 9 Prototype Shelter, Rail Hump Test, Final Report, May 1980, TECOM Project NO: 6-CO-160-000-077.
- 10 Prototype Shelter, Rail Transport Test, Final Report, August 1980, TECOM Project NO: 6-CO-160-000-078.
- 11 Type V Mobility Testing of S-280 Shelter, Final Letter Report July 1970, TECOM Project NO: 6-CO-160-000-047.
- 12 Prototype Shelter, Rail Hump Test, Final Letter Report, W.C. Brown, March 1979, TECOM Project NO: 6-CO-160-000-064.
- 13 2 - For - 1 Expandable 150 SPAM Shelter, Major K.W. Allen, June 1976, TCATA Test Report NO: FM 303.

RPT NO.	TITLE
14	Development Test II of One-Side Expandable Rigid Wall Shelter, R.E. Hayes, B.R. Naegle, Final Report, August 1980.
15	Development Test II of One-Side Expandable Rigid Wall Shelter, Capt. J.W. Lewis, Final Report August 1980.
16	Detection of Corrosion in Portable Vans and Shelters, USAF, PRAM Program Final Report, February 1980, Project NO: RA 78-4.
17	Extended Life of CEM Vans and Shelters, USAF, PRAM Program Final Report, January 1980, Project NO: RA-56.
18	Cleaning and Corrosion Removal From Communications Electronics-Meteorological Vans and Shelters, USAF, PRAM program Final Report, January 1979, Project NO: RA-79.
19	Study of EMI/RFI Shielding of Tactical Shelters, R. McCormack, C. Hahin, R. Lampo, P. Sonnenburg, Final Report, April 1980, ESL-TR-80-24.
20	US Army Rigid Wall 8'X8'X20' Shelters and US Marine Corps 8'X8'X20' Rigid Wall and Knockdown Shelters, US Army Quartermaster School, Independent Evaluation Report, October 1978, TRACOC ACN. 20499.
21	Independent Evaluation Report, Development Test II for the AN/TCC-39 () (V) Circuit (CS), Capt. A. Scharp, May 1980, TECOM Project NO: 6-EE-TCC-038-008.
22	Engineer Design Test, ECS/CCG Shelter for Patriot Missile System, Final Letter Report, L. Harrison, September 1977, TECOM Project NO: 3-MI-C93-SAM-002.
23	Operational Test III (OT III) of Video Technical Control Center, AN/TSQ-85, Test Report, J.F. Jordan, June 1980, TRADOC TRMS NO: 80-OTN-381.
24	Operational Test IIA of the Air Traffic Control Tower AN/TSW-7A, Final Report, Capt. A.R. Jones, April 1979, TRADOC TRMS NO: 8-OTN 3005.

RELIABILITY PROBLEMS

RPT NO.	RELIABILITY PROBLEM
1	<p>a) Both the AN/TRC-117 (S-280) and the AN/TRC-145 (S-250). The operating personnel were unable to open the emergency exit in the required three seconds (MIL-STD-1742 B, para. 5.13.4.2). An average of 25 seconds was needed to open the emergency exit. This problem was identified in a previous test (DT III of the AN/TSQ-84). The problem is inherent to the S-280 shelters. (Safety Problem). There is no emergency exit on the S-250. They are referring to the smaller door located in the large door.</p> <p>b) Both the AN/TRC-117 and the AN/TRC-145 sustained permanent damage during the rail transportation subtest. Damage consisted of broken bolts in mounting racks, racks loosened from walls and washers on bolts pulling through holes in mounting bars.</p> <p>c) The shelter door locking device is unsatisfactory because the pin used to hold the door open usually became wedged at an angle and was difficult to remove when closing the shelter door (AN-TRC-145 (S-250)).</p> <p>d) Latch on the door vent cover does not hold the air vent open on windy days. Operator must frequently reposition the door air vent. (S-250).</p> <p>e) TRC-117/151 wt. imbalance 9.2% (T) TRC-145 wt. imbalance 5.8% (T)</p> <p>f) See b above. Bent Z bar, broken bolt, small tear in inner skin of shelter and evidence of washers on bolts retaining Z bars pulling thru the holes in the Z bars (TRC-117). TRC-145 - racks loosened from wall, 3 bolts holding the racks to the hat sections pulled through. Test aborted after 2nd impact.</p>
2	<p>a) 20' 3:1 ISO - two original locking door braces and one replacement bent or broke during use.</p> <p>b) 20' 3:1 ISO - Some of the interior latches could not be locked or would pop loose due to bowing of the wall and roof panels caused by solar heating. (Summer FT. Hood TX.).</p>

RELIABILITY PROBLEM

RPT NO.

RELIABILITY PROBLEM

- 2
- c) 20' 3:1 ISO - Light leaks at vent fan and at bottom of blackout shades.
 - d) both shelters should be camouflage painted.
 - e) 20' 3:1 ISO - Was dropped 6' to 12' to SOD (relatively level) following helicopter lift. The following resulted:
 - 1) 3 fluorescent light tubes fell to floor and most of rest were loose.
 - 2) 2 of 9 light fixtures pulled loose from ceiling about 1 inch on one end of the fixtures.
 - 3) 1 of 4 stowage sockets for the support struts of the expanding roof panels pulled loose from the panel.
 - f) 210' 3:1 due to narrow track of dolly and high center of gravity of shelter, the shelter leaned threateningly on curves. One stowed light came out because the spring-loaded plunger of the stowage provision had not been fully seated.
 - g) 20' 3:1 With a 5K load on a M689 dolly (3920 lbs) the wt. is 14,420 lbs. This exceeds the 10K capacity of a 2 1/2 ton but meets the 15K capacity of the 5 ton (unloaded); however, only 580 lbs can be carried in the truck (2-3 people)?
 - h) 20' 3:1 6K Military forklift and 10K lb rough terrain forklift used. Tines not long enough to prevent damage to center of floor. Reason why two were used.
 - i) 3:1 bottom of shelter damaged by dragging. Accidental drag.
 - j) Could not enter 3:1 unless mobilizer taken off.
 - k) 10' design max payload - 3K.
 - l) 3:1 While the shelter was being transported or leveled, certain movements caused the latches holding the combined folding floor and wall to unlatch.
 - m) 3:1 The shelter couldn't be transported in a 5 ton large truck bed because of width. Flatbed semi trailer requires two forklifts or a large crane and spreader assy to load them.

RELIABILITY PROBLEM

RPT NO.

RELIABILITY PROBLEM

- 4
- a) The folding side wall brace assembly was prone to breakage in the stowed position. The assembly also has a tendency not to lock in the extended position, endangering operator personnel.
 - b) While being lifted and transported by a CH-47B helicopter, the shelter had a tendency to oscillate at airspeeds above 35 knots. (without ballast weight)
 - c) The support struts, used to raise and lower the roof panel, were constructed in such a way that repeated use allowed the strut attaching bolt holes to wear or become elongated. Such elongation of the holes allowed the struts to assume angles which prevented them from passing through the opening between the stowed folding end walls. Several incidents occurred where parts of the operator's body became trapped between the support strut handles and the stowed folding end wall.
 - d) Several incidents occurred in which operators were picked up and thrown to the rigid side wall by the support struts under the force of the folding roof panel.
 - e) The release tabs on the folding wall support struts were covered with a piece of rubber that was glued on. After a number of operations had been completed, the rubber fell off and was lost, exposing sharp edges of the release tab.
- 5
- a) During lift by a CH-47C helicopter, between 50-70 knots, the empty shelter had a tendency to turn broadside to the direction of flight and begin oscillating
 - b) Shelter doors and ventilation fans had no blackout capability.
 - c) The mean light level measured in the shelter with lights on, doors closed, and windows covered was 22.8 foot-candles. The minimum illumination level, recommended in MIL-HDBK-759 for general office use is 50 foot-candles.
 - d) Of 46 personnel, 14 adversely commented on the sound absorption characteristics of the shelter.

AD-A117 735

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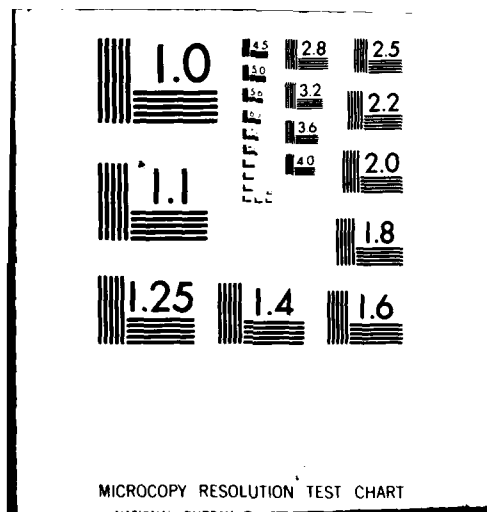
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RELIABILITY PROBLEM

RPT NO.

RELIABILITY PROBLEM

- 5
- e) Orienting the shelter when lowering to the ground by the helicopter was difficult. The helicopter's prop wash caused the shelter to rotate slowly. This problem was reduced, but not eliminated by using a longer sling.
 - f) Neither the personnel door nor the cargo door of the shelter could be opened once the M689 dolly set was attached. It was necessary to completely detach and move the M689 before the doors could be opened.
 - g) The bottom construction of the shelter is an open frame work without skids. Dragging the shelter could cause problems.
 - h) The shelter was provided with no means of securing items other than the component parts of the shelter.
 - i) The lack of doorsteps made entering and leaving the shelter hazardous. Height from the ground to door threshold varied from 8 to 22 inches, depending on the ground slope.
 - j) The fragility of the shells was a problem. Small objects such as tree limbs easily punched holes in the shells.
 - k) One aluminum floor beam was damaged when the upper metal connecting lip on one end sheared. Cause of damage is unknown.
- 6
- a) Risk of personnel electrical shock as well as electrical shorts of equipment while working on drawers exposed to rain while power was still applied (AN/MS-59).
 - b) Significantly high noise level was present which could incur permanent ear damage (AN/TSC-85).
 - c) (AN/MS-59) During the last 5 to 10 minutes of the first test flight, the trailer dust cover was damaged by the force of the down wash from the helicopter.
 - e) (AN/TSC-85) It was determined that test item could not be lifted without major damage to the antenna petals and other components. Several alternatives were studied but none proved to be satisfactory.

RELIABILITY PROBLEM

<u>RPT NO.</u>	<u>RELIABILITY PROBLEM</u>
6	<p>f) AN/TSC-85 By study it was determined that the truck with shelter mounted could not be loaded. The trailer was determined to be too high for internal loading by US Air Force aircraft without major disassembly.</p> <p>g) The steps on the side of the shelter presented more of a hazard than aid for operators to get on top of the terminal. Operators were observed mounting the shelter over top of the truck cab. One operator fell through the cab top while mounting the shelter.</p>
7	<p>a) No reliability problems were reported for the shelter.</p>
8	<p>a) Seven rivets leaked on the vertical corner rails during a construction tightness test prior to the actual testing</p> <p>b) A kickout panel in the door leaked due to an inadequate weld during a construction tightness test.</p> <p>c) A second construction tightness test was conducted after repairing the damages noted during the first rail impact test (a&b above). Testing revealed that four rivets leaked slightly, one in the rear of the top closure angle, two in the rear (right side) of the vertical corners and one on the top closure angle (curbside). The sealer beads leaked at the bottom rear closure angle and the corner casting. One mobilizer rivnut leaked along with the sealer bead on the front mobilizer coner plate. All sealer lead leaks were repaired before further testings.</p> <p>d) The shelter was placed under a rain rack and exposed to the conditions noted in the specification. A puddle of water was observed at the door end of the shelter. It was determined that the door gasket was leaking due to contaminates on the gasket sealing surface. These contaminates were deposited in the movement of the shelter to and from the various test locations or during the installation and removal of the test weights or in the performance of other tests.</p>

RELIABILITY PROBLEM

<u>RPT NO.</u>	<u>RELIABILITY PROBLEM</u>
8	<p>e) The S-280 shelter was placed in a fording tank and immersed to a depth of 21 inches above the bottom of the skids. A leak was immediately noticed at the bottom edge of the door due to damage of a section of the the door extrusion and gasket. The gasket had seperated from the door extrusion and was dented approximately .030 " deep X 5" long.</p> <p>f) The shelter was tested for heat transfer properties. An overall coefficient of heat transfer was determined to be $U=0.273 \text{ Btu/Hr/Sq Ft/}^\circ\text{F}$. This exceeds the $0.25 \text{ Btu/Hr/Sq Ft/}^\circ\text{F}$ limit in the spec and is considered a shortcoming.</p> <p>g) During the rail hump impact test at 8,9 and 10 mph. both in forward and reverse directions, the following deformations were noted: In the front of the shelter on both sides, approximately 1 inch from the corner fittings, two areas deformed. These areas were approximately 23 inches long X 4 inches high and at the high point, protruded about 1/4 to 3/8 inches beyond the shelter structure. The areas in the rear of the shelter (door end) on each side next to the corner fittings suffered damage.</p> <p>h) The shelter was subjected to both flat and rotational drops. The shelter showed no damage but the skids did show some slight deforamation and splitting of the welds.</p> <p>i) The standard S-280 shelter has been unable to meet minimum RFI requirements unless an oil based sealant and RFI compound were utilized in the panel joint areas. However, sealant and compound gradually deteriorated during the normal service life of the shelter and satisfactory RFI attenuation characteristics could not be maintained due to inadequate panel joint integrity.</p>

RELIABILITY PROBLEM

- | RPT NO. | RELIABILITY PROBLEM |
|---------|---|
| 9 | a) An S-280 shelter was tested to see if the rail transport impact test requirements of MIL-S-55286B (EL), para. 4.19.2 could be met. During the 14.5 Km/Hr (9 mph) impacts in the reverse direction (door end facing stationary cars) the three door hinges bent causing the door in the are of the hinges to spring open. The bending of the hinges became more pronounced during the ensuing impacts at 16.1 Km/Hr (10 mph). This was the only damage incurred to the shelter during the hump test. |
| 10 | a) The objective was to determine if the S-280 shelter meets the rail transport impact test requirements of MIL-S-55286C (EL), para. 4.6.22. During the fourth impact at 14.5 Km/Hr (9 mph) in the reverse direction (door end facing the stationary cars) the lower right front (curbside) tiedown ring anchor pin pulled loose. This was the only damage incurred by the shelter during the impact test. |
| 11 | a) No reliability problems were encountered during the type V mobility test as specified in paragraph 4.5.12 of MIL-M-8090E. |
| 12 | a) The shelter was scheduled for a rail impact test. After the first impact at 9 mph in the rearward direction (seventh total impact), damage was noted on the right side of the shelter. The damage consisted of a bulged area approximately 15 1/2 inches long X 2 inches wide and 3/8 of an inch high. An identical bulge was found on the rear inside wall.

b) Inspection after the eleventh impact (10 mph forward direction) revealed severe damage to the floor surface at the door end of the shelter. The deformed area was 57 inches long X 2 3/8 inches wide X 5/16 inches high and ran parallel to the wall along the floor (door end) extrusion box closure. There was a delaminated area 16 inches long X 3 inches wide X 1/4 inch high. |

RELIABILITY PROBLEM

- | RPT NO. | RELIABILITY PROBLEM |
|---------|---|
| 13 | <ul style="list-style-type: none">a) The shelter ceiling was not high enough for a T55 engine to be repaired or removed.b) The door brace held the door open in the 90° position. One door was damaged when a driver tried to get a vehicle close to the shelter.c) The shelter did not have provisions for blackout protection when doors were opened at night.d) During helicopter lift flight one, at speeds faster than about 55 knots, the shelter began to oscillate from side to side and turn. During helicopter lifts two and three, the shelter began to oscillate at speeds faster than 65 and 70 knots, respectively.e) In a nontest - related incident, the bottom construction of the shelter was damaged, apparently when it was dragged. The bottom of the shelter was an open frame work without skids. The shelter was not designed to be dragged.f) During a pretest expansion, the threaded insert for one of the screws holding the left strut bracket was found stripped. The shelter was expanded or contracted five times using only the right strut before its bracket broke. |
| 14 | <ul style="list-style-type: none">a) Unsuccessful attempt's were made to erect the shelter in temperature categories C2 (cold) and C3 (severe cold). (-45° F and -51° F)b) Snow and ice build-up on the roof of the expandable side prevented closing the expandable components because the floor section closed on the outside portion of the roof.c) The shelter's leveling jacks' ratchet mechanisms required two-handed operation which was impossible while wearing hand protection because the functioning portion of the ratchet head was located inside the jack strut and access was limited.d) Five roll pins broke at various latch points while attempting to secure the test item. On four occasions the expandable wall and side securing latch roll pins broke while attempting to secure the latches. The roll pin for the expandable floor locking device broke once. |

RELIABILITY PROBLEM

<u>RPT NO.</u>	<u>RELIABILITY PROBLEM</u>
	<ul style="list-style-type: none">e) Binding of the expandable component hinges and the solar bar occurred when the shelter was emplaced.f) The two expandable wall braces that secured the front expandable wall had a tendency to slip allowing the front wall to fall.g) The thermographic images collected showed heat loss around door and window seals and the seals associated with the expandable side.h) The shelter could not be controlled while backing it on the mobilizers. Eight attempts were made using three different drivers and each driver had similar difficulties.i) On two occasions the side support brace stowage bracket seperated from the shelter because the rivets were not strong enough to hold the bracket in place.j) Vibration of the shelter as it was being moved, caused a flourescent light assembly and latch to separate from the shelter.
15	<ul style="list-style-type: none">a) Sand and dust had an adverse effect on the operation of the shelter. Rachets and hinges on the shelter operated at reduced efficiency.b) Delamination of the interior shelter floor was discovered at the conclusion of the performance characteristics test. This delamination occurred in two areas, each area 24 inches by 36 inches (0.61m by 0.91m) in size and located directly under the weight trays.c) The blackout curtains were not sufficient to prevent the escape of interior light when the installed flourescent lights were in use.d) The cable controlling the expanding floor and sidewall failed, making the opening and closing of the shelter impractical.e) The sidewall support braces failed, causing an extreme safety hazard to operating personnel.f) The operators experienced inconvenience using the steps giving access to the roof because of the order of their placement.g) Raising and lowering the folding roof panel were difficult for personnel of light to medium physical stature.

RELIABILITY PROBLEM

RPT NO.	RELIABILITY PROBLEM
16	a) Visual and "tapping" corrosion detection techniques are successful only after significant corrosion damage had occurred. Corrosion can continue unchecked during the interval between the initial damage and the time its presence is detected. Approximately five previously repaired shelters for SM-ALC had to be returned for rework because of inadequate inspections using techniques other than eddy currents.
17	a) Many of the shelters surveyed at Bergstrom AFB had delaminated floors due to moisture penetration into the interior of the panels. b) The experience of the SM-ALC depot indicates that impact and forklift damage was found on 40% of the shelters returned to depot. No delaminations were discernable outside of the immediate indented area. c) S-280 shelters which were to be modified into repair shelters at Red River Army Depot were observed to have cracked rain flaps. Degradation of these non-metallics is severe when they are exposed to weathering. d) In a survey, many of the defective shelters appeared to have been defective at the time of delivery from the factory, indicating poor quality control in manufacturing. e) A common complaint of the depot repair personnel is that they have little instruction to work from and that the repair procedures that have been developed have not been recorded.
19	a) On all shelters which do not have welded seams, periodic maintenance testing is necessary to insure that the shelter continues to provide specified EMI/RFI shielding levels. b) When dual aluminum-sheet panels are joined by methods other than welding, corrosion can occur in the seams due to either moisture entrapment in the construction processor loss of a seal at some point. Corrosion in the seam can cause serious degradation in EMI/RFI shielding effectiveness. c) Analysis of EMI/RFI testing procedures has indicated that most test methods now used for shelters will not assure that worst-case shielding effectiveness is being measured and that points of worst leakage are being located.

RELIABILITY PROBLEM

<u>RPT NO.</u>	<u>RELIABILITY PROBLEM</u>
20	<p>a) Erecting/complexing and striking as determined by the ACEBD are unsafe for hours of darkness and rain/wet conditions. Other safety hazards consist of personnel lifting the knockdown shelter roof section, lack of adequate holding devices on end and side walls, handling fiberglass materials, roof access and nonskid floor material.</p> <p>b) Special tools/handling equipment are required to erect/complex and strike the rigid wall and knockdown shelters. The requirement to lift the roof by 15 personnel is excessive weight per personnel when erecting/complexing and striking. The weight of the roof is approximately 1,000 pounds which would require 20 personnel. MHE is needed to move the roof section.</p>
21	<p>a) The full impact test of the 300-line single-shelter resulted in a PS-12 power supply failure and in unacceptable physical deformations and structural damage to the shelter.</p> <p>b) Minor shelter skin and internal defromations resulted from drop tests, indicating a need for greater structural strength around the bottom edges of the shelter.</p> <p>c) The weight criterion for any CS is 7000 pounds. The actual weight for the appropriately configured 300-line CS was 8386 pounds.</p> <p>d) The criterion for maximum permissible weight imbalance is 5%. The 300-line CS single shelter and the 600-line CS control shelter are imbalanced.</p> <p>e) The CS shelter failed to meet the low temperature -50°F start up time of 1/2 hour because of failures of the shelter lights.</p> <p>f) There were small leaks present in the rain test.</p>
22	<p>a) The conical alignment pin welded to the head of the lockout bolt was broken off when the shelter was dropped on the right front corner during the drop test. There was no other apparent structural damage as a result of the drop test.</p>

RELIABILITY PROBLEM

<u>RPT NO.</u>	<u>RELIABILITY PROBLEM</u>
23	a) No reliability problems found.
24	a) The shelter storage drawers and RF signal entry panel cover had sharp edges that could cause injury to personnel. b) Limit stops were not provided on the shelter storage drawers. c) The work space in the shelter was insufficient. This impeded access and egress and caused various switches to be inadvertently turned off and filters to be detuned by contact with the operators chairs, knees and feet. d) Visibility from inside the shelter was inadequate. e) Interior blackout lighting was not provided to permit blackout tactical operation and the lighting system provided was inadequate.

APPENDIX H
TEST ADEQUACY AND SEQUENCING

Scope of Investigation

The various shelters of the standard family, the specifications covering the shelter and the reference at the end of this section are given in Table 1.

The level of testing prescribed in the specifications varies considerably. Extensive testing and/or a preferred sequence of tests exist for the Army S-250 and S-280 shelters, the Navy 20-ft ISO shelter, the Air Force S-530 shelter, the Army DES X-1-77 2:1 expandable shelter, and in the JOCOTAS Proposed Document. Very little testing is defined in the Marine Corp. shelter specifications although detailed descriptions of the cause for rejections are presented.

Several documents of Table 1 were reviewed within the context of the specifications themselves. Suggestions relative to the timing of the test were made for each test. In addition, a general shelter life real time sequence of events was assumed and from this a sequencing of tests by category of tests was established. The two processes produced very similar sequences and hence, the latter, simpler approach was used for the remaining shelter test specifications and the JOCOTAS Document tests.

The order for test sequence was established using judgements as to the life event sequencing of the standard family of shelters.

The exact order in which the testing for any, and indeed all, of the standard family of shelters is approached as objectively as can be possible under current circumstances. The sequence of events occurring in any individual shelter is totally unpredictable at the moment of its delivery. Even the assumed general characteristic event-sequence is unknown. The following event sequence is assumed:

<u>Phase</u>	<u>Description</u>
1	Construction and Manufacturing
2	Test
3	Delivery
4	Storage
5	Removal from storage - shipment
6	Outfitting or refurbishment
7	Facility Test
8	Service Use
9	Removal from service -shipment
10	Repeat of items 4-8 up to three times
11	Withdrawal from service

TABLE 1. SHELTERS AND APPLICABLE SPECIFICATIONS

Type of Shelter	Description	Specification	Reference
Rigid	Army - S250	MIL-S-55541D(EL)	1
	Army - S280	MIL-S-55286C(EL)	3
	Army - 20 ft ISO		
	Marine 10 ft ISO (EMI)	9219-003	35
	Marine 20 ft ISO	9219-001	6
	Navy 20 ft ISO	MILS-81030D(AS)	4
	Marine 20 ft ISO (EMI)	9219-003	35
Expandable	AF S530	CP550100-E	2
	Army 2:1 ISO	DES-X-1-77	5
	Army 3:1 ISO		
Knockdown	Marine 20 ft ISO	9219-002	7
	JOCOTAS	xxxx	8

During Phase 1, no testing of the overall unit is to be performed; however, all component and/or subelement testing and inspection is to be performed. For those items prepared during Phase 1, but to be tested during the testing Phase 2, and being performed on subelements in unique test circumstances, the test sequence is unimportant. We refer to these tests as construction tests and count them as inspection. For shelter level tests during Phase 2, the test sequence is important.

During delivery transportation type and some environmental type loading inputs will be induced. During storage, environmental inputs will be induced. During refurbishment and outfitting (Phase 6), some load or stress inputs will be incurred; during service, transportation and environmental inputs will be incurred. Thus a plot of potential input versus overall shelter life is shown in Figure 1. The inputs occur in several ways. The environmental inputs are incurred throughout the useful life of the structure. The transportation loads occur only during shipment and reshipment from storage to service site or from service site to service site or from service site to storage. Thus they appear as sudden inputs at various times in the overall service lifetime of the shelter. Service loads occur at random times during the service life of the shelter.

In addition to the sequential occurrence of inputs, the test sequence should reflect severity of the conditioning and load inputs. The coupling of the effects on the structure from the tests cannot be duplicated on a test by test basis, but could reflect the overall more or less sequence of real-time events.

With these two criteria in mind, the following general category sequence was established for the Phase 2 test program:

- (1) Inspection tests
- (2) Transportation and handling tests
- (3) Environmental tests
- (4) Service load tests
- (5) Performance tests

Inspection tests (1) should occur first since they reflect initial conditions and are generally performed first. Deterioration effects, if any, induced by the testing on the shelter would be present immediately upon final acceptance of the lot of shelters. One of the early events in the service life of the

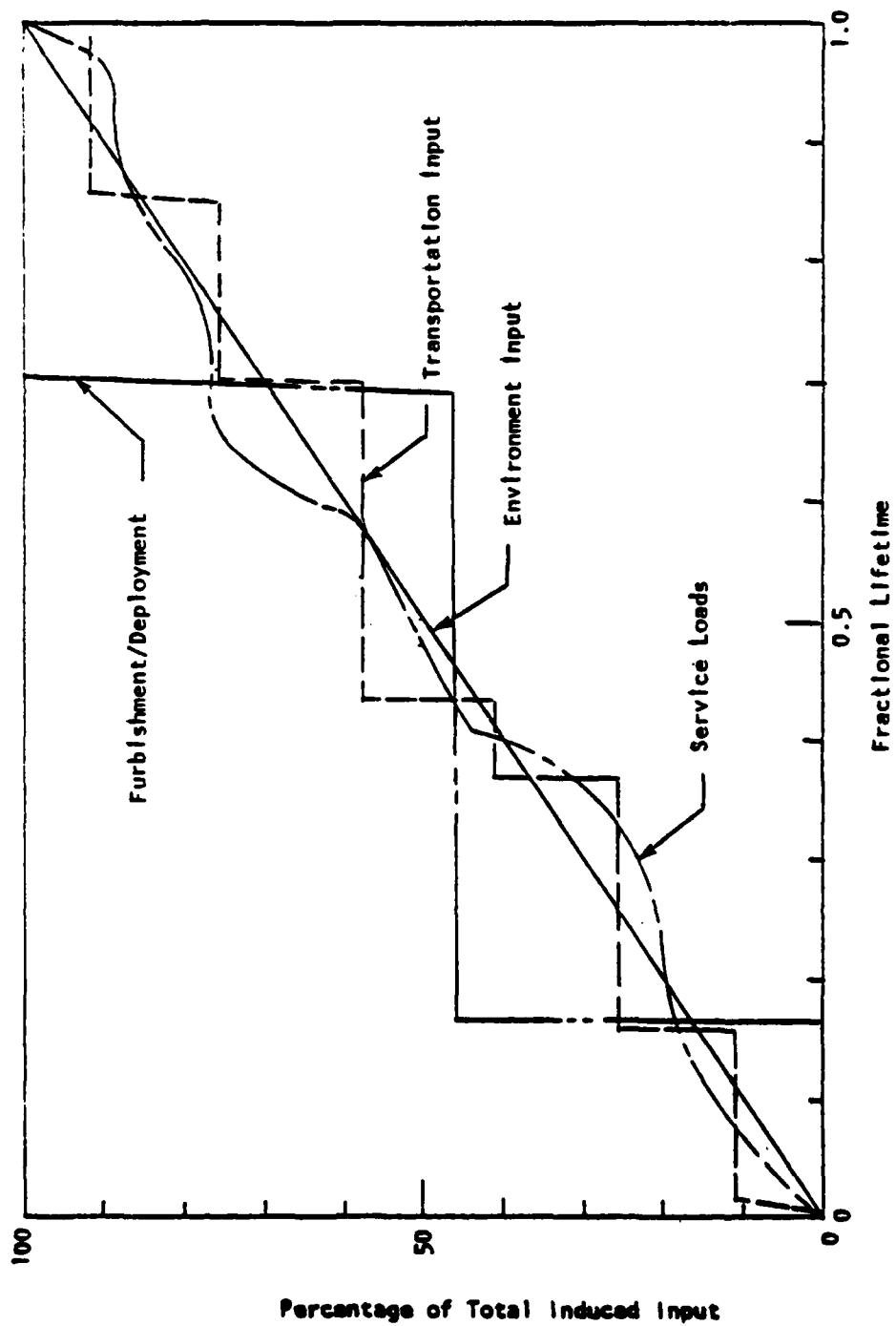


Figure 1. Input induced during lifetime of individual shelter of standard family.

shelter is transportation to the procuring agency; thus transportation related testing should follow the inspection test series. Environmental tests (3) would seem to be the next test series, reflecting the long-term effects of both storage and service life. Service-type tests (4) reflecting routine useful input loadings on the shelter would be next; the inputs must be assumed even late in the overall life (15 years) of the shelter. Finally, performance tests (5) should be performed after all other inputs have been imposed to reflect the operational characteristics in existence after a long service program (as reflected by a long test program).

For the Phase 7 test program the same test sequence and rationale are proffered except that the inspection tests may be deleted.

The test listed in Table 2 present the current listing of tests per M11 S-55541D(EL) for the S-250 shelter (Reference 1) together with our designation of test category. The order prescribed in M11 S-55541D(EL) for testing is shown in Table 3. In accordance with the general scheme presented earlier the sequence shown in Table 4 is proffered for consideration.

Items 1-5 of Table 4 all call for direct measurement of items called for in a procurement specification and would be performed first. Item 4 would also be performed on typical sub-structural elements to assure compliance with the materials capabilities requirements.

Following the initial dimensional sizing and fitability tests, a battery of six tests (6-11) associated with transportation are performed. This test series terminates with the fording test (11). The environmental series which follows begins with the moisture resistance (12) and is followed by two thermal tests (13, 14). Tests for service imposed inputs (15, 16, 17) and performance tests (18, 19, 20) then follow.

Similarly, the M11 S-55286C(EL) specification (Reference 3) for the S-280 Electrical Equipment Shelter has a test program as outlined in Table 5. The sequence of tests required per M11 S-55286C(EL) for S-280 shelters is given in Table 6. In accordance with a scheme similar to that used for the S-250 shelter above, the plan shown in Table 7 would be used for testing S-280 shelters.

Similarly, Specification CP-55-100-E (Reference 2) for the S530 AG shelter has a test program as outlined in Table 8; the sequence of tests required per CP550100-E for S530 A/G shelters is as shown in Table 8; the proffered sequence of tests is shown in Table 9 for the S530 shelter similar to those shown in Table 3 for the S-250 shelter and in Table 7 for the S-280 shelter.

TABLE 2. TESTING PROFILE AS LISTED IN MIL-S-55541D(EL) DATED 18 FEBRUARY 1977
FOR THE S-250 ELECTRICAL EQUIPMENT SHELTER

Paragraph Number	Test Designation	Test Category
4.6.1	Visual and Mechanical Inspection	(1) Inspection
4.6.2	Interchangeability	(1)
4.6.3	Dimensional Inspection	(1)
4.7 - 4.1	First Article Tests	(1)
4.12	Shelter Weight	(1)
4.13	Moisture Resistance	(3) Environmental
4.14	Temperature	(3)
4.15	Heat Transfer	(3)
4.16	Rail Transport	(2) Transport and Handling
4.17	Simulated Lift Transport	(2)
4.18	Drop Test.	(2)
4.19	Towing Simulated	(2)
4.20	Lifting and Towing Eye Tests	(2)
4.21	Roof Access Steps	(4) Service Load Tests
4.22	Door Latch Torque	(5) Performance Tests
4.23	EMI Shielding	(5)
4.24	Construction Tightness	(4) and (5)
4.25	Water Tightness	(4) and (5)
4.26	Fording	(2)
4.27	Light Tightness	(5)

TABLE 3. SEQUENCE OF FIRST ARTICLE S-250 SHELTER TESTING PRESCRIBED IN MIL-S-55541D(EL)

Order in Test Sequence	Inspection Designation	Rqd Paragraph	Inspection Paragraph
1	Construction Tightness	3.10.3	4.24
2	Visual and Mechanical Inspection	3.1	4.6.1
3	Interchangeability	3.1.9	4.6.2
4	Dimensional Inspection	3.1	4.6.3
5	Torque, Door Latches	3.10.1	4.22
6	Shelter Weight	3.6	4.12
7	Moisture Resistance	3.8.1	4.13
8	Temperature	3.8.2	4.14
9	Heat Transfer	3.8.3	4.15
10	Rail Transport	3.9.1.1	4.16
11	Drop Tests	3.9.2	4.18
12	Towing, Simulated	3.9.3	4.19
13	Lift Transport, Simulated	3.9.1.2	4.17
14	Steps, Roof Access	3.9.5	4.21
15	Lifting and Towing Eye Tests	3.9.4	4.20
16	EMI Shielding	3.10.2	4.23
17	Shelter Weight	3.6	4.12
18	Water Tightness	3.10.4	4.25
19	Shelter Weight	3.6	4.12
20	Fording	3.10.5	4.26
21	Shelter Weight	3.6	4.12
22	Torque, Door Latches	3.10.1	4.22
23	(see Note 1)	-	-
24	Torque, Door Latches	3.10.1	4.22
25	Water Tightness	3.10.4	4.25
26	Shelter Weight	3.6	4.12
27	Fording	3.10.5	4.26
28	Shelter Weight	3.6	4.12
29	Light Tightness (see Note 2)	3.10.6	4.27

Notes:

1. Remove shield, EM, SM-B-564670 (part of Modification Kit, EMI, MK-1092())/G from around both the inner and outer doors. No other adjustments are to be made.
2. May be performed at any stage of testing that is satisfactory to the government technical activity designated in the contract.

TABLE 4. PROFFERED SEQUENCE OF TESTS FOR S-250 SHELTER

Order In Test Sequence	Test Description	Paragraph Number
1	First Article Tests	4.7-4.11
2	Visual and Mechanical Inspection	4.6.1
3	Dimensional Inspection:	4.6.3
4	Shelter Weight	4.12
5	Interchangeability	4.6.2
6	Lifting and Towing Eye Tests	4.20
7	Rail Transport	4.16
8	Simulated Lift Transport	4.17
9	Drop Test	4.18
10	Simulated Towing	4.19
11	Fording	4.26
12	Moisture Resistance	4.13
13	Temperature	4.14
14	Heat Transfer	4.15
15	Roof Access Steps	4.21
16	Construction Tightness	4.24
17	Water Tightness	4.25
18	Door Latch Torque	4.22
19	EMI Shielding	4.23
20	Light Shielding	4.27

TABLE 5. TESTING PROFILE AS LISTED IN MIL-S-55286C(EL) DATED 18 JULY 1977 FOR
THE S-280 ELECTRICAL EQUIPMENT SHELTER

Paragraph Number	Test Designation	Test Category
4.6.1-4.6.7	In Process Inspection Test (First Article)	(1) Inspection
4.6.8	Interchangeability	(1)
4.6.9	Riveting	(1)
4.6.10	Construction Tightness	(5) Performance Test
4.6.11	Finish	(1)
4.6.12	Marking	(1)
4.6.13	Dimensional	(1)
4.6.14	Visual and Mechanical	(1)
4.6.15	Shelter Weight	(1)
4.6.16	Door Latch Torque	(2) Transport and Handling
4.6.17	Moisture Resistance	(3) Environmental
4.6.18	Temperature	(3)
4.6.19	Thermal Differential	(3)
4.6.21	Vehicular Transport	(2)
4.6.22	Rail Transport	(2)
4.6.23	Drops	(2)
4.6.24	Towing	(2)
4.6.25	Eye Pulls	(2)
4.6.26	Air Transport	(2)
4.6.27	Static Door Load	(5)
4.6.28	Roof Access Steps	(4) Service Load Test
4.6.29	Light Tightness	(5)
4.6.30	Electromagnetic Interference Suppression	(5)
4.6.31	Water Tightness	(5)
4.6.32	Fording	(5)

TABLE 6. SEQUENCE OF FIRST ARTICLE S-280 SHELTER TESTING PRESCRIBED IN MIL-S-55286C(EL)

Inspection	Req'd Paragraph	Test Paragraph
Cleaning	3.4.2	4.6.4
Welding	3.4.3	4.6.5
Lamination	3.4.4	4.6.6
Interchangeability	3.4.6	4.6.8
Riveting	3.4.7	4.6.9
Construction Tightness	3.7.1	4.6.10
Finish	3.4.8	4.6.11
Marking	3.4.9	4.6.12
Dimensional	3.4.1	4.6.13
Visual and Mechanical	3.8.2	4.6.14
Shelter Weight	3.4.10	4.6.15
Door Latch Torque	3.7.2	4.6.16
Moisture Resistance (1)	3.5.1	4.6.17
Temperature	3.5.2	4.6.18
Thermal Differential	3.5.3	4.6.19
Vehicular Transport	3.6.1.1	4.6.21
Rail Transport	3.6.1.2	4.6.22
Drops	3.6.2	4.6.23
Towing, Simulated	3.6.3	4.6.24
Eye Pulls	3.6.4.1	4.6.25.1
Air Transport, Simulated	3.6.1.3	4.6.26
Static Door Load	3.6.5	4.6.27
Roof Access Steps	3.6.6	4.6.28
Light Tightness	3.7.3	4.6.29
Electromagnetic Interference Suppression	3.7.4	4.6.30
Water Tightness	3.7.5	4.6.31
Fording	3.7.6	4.6.32
Door Latch Torque (Second Time)	3.7.2	4.6.16

(1) First Article specimen testing to be completed no later than the end of this test.

TABLE 7. PROFFERED SEQUENCE OF TESTS FOR S-280 SHELTER

Order In Test Sequence	Test Description	Paragraph Number
1	In Process Inspection Tests	4.6.1-4.6.7
2	Riveting	4.6.9
3	Finishing	4.6.11
4	Marking	4.6.12
5	Dimensional	4.6.13
6	Visual and Mechanical	4.6.14
7	Shelter Weight	4.6.15
8	Interchangeability	4.6.8
9	Door Latch Torque	4.6.16
10	Vehicular Transport	4.6.21
11	Rail Transport	4.6.22
12	Drops	4.6.23
13	Towing	4.6.24
14	Eye Pulls	4.6.25
15	Simulated Air Transport	4.6.26
16	Fording	4.6.32
17	Moisture Resistance	4.6.17
18	Water Tightness	4.6.31
19	Temperature	4.6.18
20	Thermal Differential	4.6.19
21	Roof Access Tests	4.6.28
22	Construction Tightness,	4.6.10
23	Static Door Load	4.6.27
24	Light Tightness	4.6.29
25	Electromagnetic Interference Suppression	4.6.30

TABLE 8. TESTING PROFILE AS LISTED IN CP550100-E DATED 19 APRIL 1974
FOR THE S-530 ELECTRICAL EQUIPMENT SHELTER

Paragraph Number	Test Description	Test Category
4.2.1.1.1 a-p	Mechanical and Visual Inspection	(1) Inspection
4.2.1.1.2	Design Inspection	(1)
4.2.1.2.1	Human Performance	(1)
4.2.1.2.2	Safety	(1)
2.3	Wall Loads	
4.2.1.3.1.1.9	Demonstration	(1)
4.2.1.3.2.1-4c	Shelter Construction Tests	(1)
4.2.1.3.3.1	Floor Load	(4) Service Load
4.2.1.3.3.2	Roof Load	(4)
4.2.1.3.3-2a	Uniformly Distributed Load	(4)
4.2.1.3.3-2b	Concentrated Load	(4)
4.2.1.3.3.3	Towing Test	(2) Transport and Handling
4.2.1.3.3.4	Skid Bearing Test	(2)
4.2.1.3.3.5	Lifting and Towing Eye Test	(2)
4.2.1.3.3.6	Roof Access Steps	(4)
4.2.1.3.3.7	Door Load Tests	(4)
4.2.1.3.3.8	Mounting Capabilities	(4)
4.2.1.3.3.9	Sling Drop	(4)
4.2.1.3.3.10	Shelter Drop Tests	(2)
4.2.1.3.3.11	Heat Transfer	(3) Environmental
4.2.1.3.3.12	Fording Tests	(2)
4.2.1.3.3.13	Sling Assembly Lift and Tiedown	(2)
4.2.1.3.3.14	Altitude Pressure Equalization	(2)
4.2.1.3.4.1	Helicopter Transport, Simulated	(2)
4.2.1.3.4.2	Rail Transport Impact Test	(2)
4.2.1.3.4.3	Bounce	(2)
4.2.1.3.4.4	Type III Mobility	(2)
4.2.1.3.5.1	Wind	(3)
4.2.1.3.5.2	Dust	(3)
4.2.1.3.5.3	Salt Fog	(3)
4.2.1.3.5.4	Sunshine	(3)
4.2.1.3.5.5	Solar Load	(3)
4.2.1.3.5.6	Temperature Shock	(3)
4.2.1.3.5.7	Humidity	(3)
4.2.1.3.5.8	Fungus	(3)
4.2.1.3.5.9	Rain	(3)
4.2.1.3.6	Shielding	(5) Performance

TABLE 9. PROFFERED TEST SEQUENCE FOR THE S-530 SHELTER

Number In Test Sequence	Test Description	Paragraph Number Per CP550100-E
1	Shelter Construction Tests	4.2.1.3.2.1-4c
2	Mechanical and Visual Inspection	4.2.1.1.1 a-p
3	Design Inspection	4.2.1.1.2
4	Safety	4.2.1.2.2
5	Demonstration	4.2.1.3.1.1-9
6	Human Performance	4.2.1.2.1
7	Wall Loads	4.2.1.2.3
8	Rail Transport Impact Test	4.2.1.3.4.2
9	Bounce	4.2.1.3.4.3
10	Skid Bearing Test	4.2.1.3.3.4
11	Towing Test	4.2.1.3.3.3
12	Lifting and Towing Eye Test	4.2.1.3.3.5
13	Sling Drop	4.2.1.3.3.9
14	Shelter Drop Tests	4.2.1.3.3.10
15	Sling Assembly Lift and Tiedown	4.2.1.3.3.13
16	Altitude Pressure Equalization	4.2.1.3.3.14
17	Simulated Helicopter Transport	4.2.1.3.4.1
18	Type III Mobility	4.2.1.3.4.4
19	Fording Test	4.2.1.3.3.12
20	Humidity	4.2.1.3.5.7
21	Rain	4.2.1.3.5.9
22	Heat Transfer	4.2.1.3.3.11
23	Sunshine	4.2.1.3.5.4
24	Solar Load	4.2.1.3.5.5
25	Temperature Shock	4.2.1.3.5.6
26	Wind	4.2.1.3.5.1
27	Dirt	4.2.1.3.5.2
28	Salt Fog	4.2.1.3.5.3
29	Fungus	4.2.1.3.5.8
30	Floor Load	4.2.1.3.3.1
31	Roof Load	4.2.1.3.3.2
32	Uniformly Distributed Load	4.2.1.3.3.2.a
33	Concentrated Load	4.2.1.3.3.2.b
34	Roof Access Load	4.2.1.3.3.6
35	Mounting Capabilities	4.2.1.3.3.8
36	Door Load Tests	4.2.1.3.3.7
37	Shielding	4.2.1.3.6

The Navy 20-ft ISO shelter covered by Specification M11 S081030D(AS) (Reference 4) has a test program defined in Table 10. There is no sequencing of tests specified in M11 S-81030D(AS). Our proffered sequence of tests is shown in Table 11.

Expandable, 2: ISO (Army) shelters are characterized according to the plan shown in Specification DES X-1-77. The tests listed in Table 12 indicate the type of tests performed for shelter acceptance. No test sequence is specified by DES X-1-77, but our suggested sequence is shown in Table 13.

The Marine Corps specifications for 10 and 20 ISO knockdown shelters were very abbreviated. Tables 14 and 15 list the quality assurance test programs for the rigid shelter and the knockdown shelters, respectively. No sequence of testing was indicated and since the testing described in the specifications was so limited, we did not recommend any sequence of testing other than in the order shown in Tables 14 and 15. Finally, the JOCOTAS Document (Reference 8) indicates the test program described in Table 16. Based upon the prior test sequences as described in Tables 4, 7, 9, 11, and 13, the proffered test sequences are shown in Table 17.

The test schedule shown in Table 17 for the standard family of shelters quality assurance test program as defined in the JOCOTAS Document (Reference 8), actually makes use of several "classes" of tests. The first "class" can loosely be called construction tests designed to demonstrate the efficacy of the materials and components used in constructing the shelter. These tests should be the first performed by the manufacturer. However, we are aware that many manufacturers do not have the facilities to do so and instead, submit the requisite number of material samples for testing an outside agency. The tests falling under this category are presented in Table 18. Another class of tests which can be treated prior to production release of the shelter units are those where the operational parameters are validated by analysis. These "Analytical Validation Tests" are presented in Table 19. No procurement/production tests are applicable to these class of tests. The component or shelter performance is characterized by analytical calculation (2-3, 2-6, etc.), or by a set of blueprints (3-10, 3-11, etc.). This class of tests calls for a document or documents to accompany the delivered shelter or shelters which

**TABLE 11. PROFFERED SEQUENCE OF TESTS FOR TESTING PROGRAM
FOR THE NAVY 20-FT ISO SHELTER**

Number In Test Sequence	Test Description	Paragraph Number Per M11 S-810300(AS)
1	First Article Tests	4.3. - 4.3.1.
2	Core	4.6.2.3. - 4.6.2.3.3.
3	Adhesive	4.6.2.4. - 4.6.2.4.3.
4	Sealer	4.6.2.5. - 4.6.2.5.3.
5	Quality Conformance	4.4. - 4.5.
6	Visual Conformance	4.6. - 4.6.1.1.
7	Dimensions	4.13.
8	Interchangeability	4.8.
9	Weight	4.11.
10	Top Lift Test	4.6.3.1.
11	Wall	4.6.3.2.1.
12	Floor	4.6.3.2.2.
13	Roof	4.6.3.2.3.
14	Door	4.6.3.2.4.
15	Restraint	4.6.3.3.1.
16	Flat Drop	4.6.3.3.2.
17	Rotation Drop	4.6.3.3.3.
18	Surface Impact	4.6.3.4.
19	Helicopter Landing	4.6.3.5.
20	Towing	4.6.3.6.
21	Stacking	4.6.3.7.
22	Fork Lift	4.6.3.7.1.
23	Leveling Jack	4.7.
24	Sting Eye Assembly	4.12.
25	Watertightness	4.6.2.1.
26	Rain Test	4.6.2.1.1.
27	Moisture Resistance	4.6.2.2.
28	Temperature	4.6.2.6.
29	Heat Transfer	4.6.2.7.
30	Altitude	4.6.2.8.
31	Acoustical Absorption	

TABLE 12. LIST OF ARMY 2:1 EXPANDABLE SHELTER TESTS
PER SPECIFICATION DES X-1-77

<u>Type of Test</u>	<u>Test Method Or Paragraph</u>	<u>Category of Tests</u>
<u>Intermediate Tests</u>		
Panel Watertightness	4.4.4.1. - 4.6.1.	Construction (1)
Insert Proof Load	4.4.4.3. - 4.6.2	(1)
Electromagnetic Compatibility	4.4.4.3. - 4.6.4.	(1)
Moisture Resistance	4.6.6.	(1)
Thermal Shock	4.6.7.	(1)
Cylinder Impact	4.6.8.	(1)
Marine Atmosphere	4.6.9.	(1)
<u>End Item Tests</u>		
Structural Soundness ¹	4.6.5.	(1)
Container Mode - Towing	4.7.1.	Transport (2)
Dropping	4.7.2.	(2)
Ground Transportation -	4.7.3.	(2)
Trailer		(2)
Mobilizer		(2)
Railroad Humping	4.7.4.	(2)
Lifting	4.7.5	(2)
Six-high Stacking	4.7.6.	(2)
Longitudinal Restraint	4.7.7.	(2)
Racking	4.7.8.	(2)
Lashing	4.7.9.	(2)
Water Leakage	4.7.10.	Environment (3)
Internal Air Leakage	4.7.11.	(2) and (3)
Temperature	4.7.12.	(3)
Weight Inspection	4.7.13.	(1)
Shelter Mode - Electrical	4.8.1.	(1)
Roof Load	4.8.2.	Service Load (4)
Floor Load	4.8.3.	(4)
Static Door Load	4.8.4.	(4)
Water Leakage	4.8.5.	(3)

TABLE 12. Cont.

Type of Test	Test Method Or Paragraph	Category of Tests
Heat Transfer	4.8.6.	(3)
Solar Load	4.8.7. (Procedure #1)	(3)
Blackout	4.8.8.	Performance (5)
Operational	4.8.9.	(1) and (5)
Step	4.8.10.	(4)
Illumination	4.8.11.	(5)
Internal Air Leakage	4.8.12.	(2) and (3)
Post Test Inspection	4.9.	(1)
Finish Inspection	--	(1)
Operability Inspection	--	(1)

¹ Examination for panel delamination shall be conducted upon completion of each characteristic test for structural soundness and shall be performed as specified in 4.6.5. Since the presence of any delamination is cause for rejection of the unit, and the lot, any further testing required should be discontinued.

TABLE 13. PROFFERED TESTING SEQUENCE FOR ARMY 2:1 EXPANDABLE
SHELTER TESTS PER SPECIFICATION DES X-1-77

Order of Test In Sequence	Test Description	Paragraph in DES X-1-77
1	Intermediate Tests	4.4.4.1. - 4.6.9.
2	Railroad Hump	4.7.4.
3	Six-High Stacking	4.7.6.
4	Racking	4.7.8.
5	Lighting	4.7.5.
6	Longitudinal Restraint	4.7.7.
7	Ground Transport	4.7.3.
8	Dropping	4.7.2.
9	Lashing	4.7.9.
10	Towing	4.7.1.
11	Internal Air Leakage	4.7.11. and 4.8.12.
12	Water Leakage	4.7.10. and 4.8.5.
13	Temperature	4.7.12.
14	Heat Transfer	4.8.6.
15	Solar Load	4.8.7.
16	Roof Load	4.8.2.
17	Floor Load	4.8.3.
18	Static Door Load	4.8.4.
19	Step	4.8.10.
20	Blackout	4.8.8.
21	Operational	4.8.9.
22	Illumination	4.8.11.

TABLE 14. TEST PROGRAM REQUIRED FOR MARINE CORP 20 FOOT ISO RIGID SHELTER PER SPEC. NO. 9219-001

Specification Paragraph Number	Test Description	Category of Test
4.1.2.1	Inspection	(1) Inspection
4.1.2.2	Reproduction Inspection	(1)
4.1.2.3	Production Inspection	(1)
4.2.1	Examination	(1)
4.2.2.1-4.2.2.1.2	Sandwich Panel Tests	(1)
4.2.2.2.2	Water Tightness Test	(3) Environmental
4.2.2.2.3	Mechanical Test	(1)

TABLE 15. TEST PROGRAM FOR MARINE CORP KNOCKDOWN SHELTER AS PER SPECIFICATION 9219-002

Specification Paragraph Number	Test Description	Category of Test
4.1.2.2	Reproduction Inspection	(1) Inspection
4.1.2.3	Production Inspection	(1)
4.2.1	Examinations	(1)
4.2.2.1-4.2.2.1.2	Sandwich Panel Tests	(1)
4.2.2.2.2	Water Tightness Test	(3) Environmental

TABLE 16. TEST PROGRAM DESCRIBED IN THE JOCOTAS DOCUMENT (REF 8) FOR ISO STANDARD FAMILY OF SHELTERS

Page Number (in JOCOTAS DOC)	Test Description	Category of Test
1-1	Air Transportability	(2) Transport
1-3 to 1-6	Inspection	(1) Inspection
1-7	Blackout	(5) Performance
1-8	ISO Requirements	(1)
1-9	Erection and Striking	(2)
1-10	Tow/Dragging Simulation	(2)
1-11	Ground Mobility	(2)
1-12	Rail Transport	(2)
1-13	Forklift Handling	(2)
2-1	Snow Load	(4) Service Load
2-2	Altitude	(2) and (3) Environmental
2-4	Temperature Range	(3)
2-5	Marine Atmosphere	(1) Construction
2-7	Sunshine	(1)
2-9	Fungus	(1)
2-10	Blowing Sand	(1)
2-11	Solar Load	(3)
2-12	Heat Transfer	(3)
3-1	Weight	(1)
3-2	Roof Loads	(4)
3-3a,b,c	Drop Tests	(2)
3-6	Part Interchangeability	(1)
3-7	Corrosion	(1)
3-9	Door Load	(4)
3-12	Impact Resistance	(2) and (4)
3-14	Panel Flatness	(1)
3-16	EMI Provisions	(5)
3-17	Shelter Squareness	(1)
3-18	Lifting and Towing Eye Strength	(2)
3-19	Floor Loads	(4)
3-20	Panel Attachment Points	(2)
3-21	Leveling Devices	(4)
3-22	Drop Tests	(2)
3-23	Air Tightness	(2)
3-24	Fire Resistance	(5)

TABLE 17. PROFFERED TEST SEQUENCE FOR SHELTERS COVERED BY THE JOCOTAS DOCUMENT (8)

Number of Test in Test Sequence	Test Description	Applicable Page in JOCOTAS Document
1	Inspection	1-3 to 1-6
2	ISO Requirements	1-8
3	Marine Atmosphere	2-5
4	Sunshine	2-7
5	Fungus	2-9
6	Blowing Sand	2-10
7	Weight	3-1
8	Corrosion	3-7
9	Panel Flatness	3-14
10	Shelter Squareness	3-17
11	Lifting and Towing Eye Strength	3-18
12	Panel Attachment Points	3-20
13	Part Interchangeability	3-6
14	Rail Transport	1-12
15	Air Transportability	1-1
16	Ground Mobility	1-11
17	Forklift Handling	1-13
18	Attitude	2-2
19	Drop Tests	3-3a,b,c
20	Impact Resistance	3-12
21	Erection and Striking	1-9
22	Tow/Dragging Simulation	1-10
23	Drop Tests	3-22
24	Air Tightness	3-23
25	Temperature Range	2-4
26	Solar Load	2-11
27	Heat Transfer	2-12
28	Snow Load	2-1
29	Roof Load	3-2
30	Door Loads	3-9
31	Floor Loads	3-19
32	Leveling Devices	3-21
33	Blackout	1-7
34	EMI Provisions	3-16
35	Fire Resistance	3-24

TABLE 18. CONSTRUCTION MATERIALS TEST

<u>Test Description</u>	<u>Page No.</u>
Marine Atmosphere	2-5
Sunshine	2-7
Fungus	2-9
Blowing Sand	2-10
Weather Seals (U.V. and Low Temp)	3-4
Corrosions	3-7
Impact Resistance	3-12
Toxicity	3-13
Panel Flatness	3-14

TABLE 19. ANALYTICAL VALIDATION TESTS

<u>Test Description</u>	<u>Page No.</u>
Anchoring	1-2
Special Tools/Kits	1-4
Ice Loading	2-3
Wind Velocity	2-6
Lightning Protection	2-8
Human Engineering	3-5
Lighting Provision	3-10
Input/Output Panels and Openings	3-11

contain the requisite calculation and "blueprints." Inspection must consist of verifying the existence of the documents and a qualified review of the calculations and blueprints.

A third class of tests simply calls for the visual inspection of dimensions, sizes, quantities, and types of materials, etc. We have listed such tests in both Tables 17 and 20. The kind of inspection procedures as defined in the JOCOTAS Document recall a second similar subclass, that is of deployability inspections. No input loads or condition are imposed on the shelter; instead, the inspection consists of witnessing intended normal operational deployment and component (parts) usages. These tests are also included in Table 20.

A complete battery of inspections/tests/validations/etc. for the shelters covered by the JOCOTAS Document is included in Tables 17, 18, 19, and 20. Some modification of the proposed test sequence shown in Table 17 is in order considering the needs of the inspecting agency. Our recommendations follow:

- First, perform all tests shown in Table 18 during the shelter developmental phase and if any material change has taken place during the manufacturing of the shelter.
- The analytical validation calculations from the Analytical tests (Table 19) should be made available at the time of delivery of the first article. There should be a separate set of calculations for each inspectable item for every material combination existent in the shelter lot delivered.
- All first article shelters and any other required inspectable articles in a given lot should be subject to the inspections called for in Table 20.
- The first article should be subject to the tests defined in Table 17.

TABLE 20. INSPECTION TYPE TESTS

<u>Test Description</u>	<u>Page No.</u>
<u>Dimensional Inspections</u>	
ISO Shelter - Maximum Size	1-3
Physical Security	1-5
ISO Requirements	1-8
Shelter Weight	3-1
Door Size	3-8
Shelter Electrical Grounding	3-15
Shelter Squareness	3-17
<u>Deployability Inspections</u>	
Interchangeability of Parts	3-6
Complexing	1-6
Erection and Striking	1-9*
Towing and Dragging	1-10*

*See Table 17.

A.2. Test Adequacy and Necessity

The documents given as References 18, 20, 24, 26, 28, and 29 were reviewed relative to testing for the S-280 shelter. Reference 32 was reviewed relative to testing for the S-530 shelter and Documents 16, 17, 27, and 31 were reviewed relative to the Army 2:1 Expandable Shelter tests. Problems encountered during the testing of the shelters and commentary associated with the problems detected are presented in Tables 21, 22, and 23, respectively.

In addition to these documents relating to the testing of shelters to specific procurement specifications, the following documents were reviewed relative to specific testable aspects of shelters in general:

<u>Article or Performance Capability</u>	<u>Reference</u>
EMI	11
Shelter Anchoring	9
Adhesives (Construction Tests)	10
Structural Load Response	15

Two other documents were utilized which described the results of field and document or user surveys of potential damage mechanisms, performance, problems, and deficiencies existent in shelters. These are listed as References 33 and 36.

The question arises from the reviews of specific shelter test programs, specific shelter elements, specific input response of shelters in general, and the shelter surveys of what quality assurance tests would be necessary to ascertain those shelter deficiencies which seem to crop up continuously and which tests are unnecessary. Reference 33 indicates that the delaminations in the S-280 noted in the field occurred for 41% of all of the S-280 shelters with post and beam construction. None of the other shelters studied herein were included in the surveys. Other typical types of failures occurring in shelters included:

- Seal Deficiency (15.5% of overall number of shelters*)
- Moisture Intrusion (14% of all shelters)
- Rivenut Deficiency (11% of all shelters)
- External Hardware (0% of all shelters).

* Includes many shelters; not only the S-280.

TABLE 21. DOCUMENTATION OF PROBLEM AREAS AND ADVERSE COMMENTS FOR
VARIOUS TESTS PRESCRIBED BY MIL-S-55286C(EL) FOR THE S-280 SHELTER¹⁰

Test Description	Reference Number							
	26		20		29		28	
	Problem	Comment	Problem	Comment	Problem	Comment	Problem	Comment
In Process Inspection Tests								
Interchangeability								
Riveting								
Finish								
Marking								
Dimensional								
Visual and Mechanical								
Shelter Weight								
Door Latch Torque			Yes	(4)				
Vehicular Transport							No	-
Rail Transport	Yes	(1)	Yes	(3)	Yes	(5)		
Drops					Yes	(6)		
Towing	Yes	(2)						
Eye Pulls	Yes	(2)						
Simulated Air Transport								
Fording								
Moisture Resistance								
Temperature								
Thermal Differential								
Roof Access Tests								
Construction Tightness								
Water Tightness								
Static Door Load			Yes	(4)				
Light Tightness								
Electromagnetic Interference								

TABLE 21. Cont.

Test Description	Reference Number			
	24	18	1418	33
	Problem	Comment	Problem	Comment
In Process Inspection Tests				Yes (12)
Interchangeability				
Riveting				
Finish				
Marking				
Dimensional	No	--		
Visual and Mechanical	No	--		
Shelter Weight				
Door Latch Torque	No	--		
Venicular Transport				
Rail Transport	Yes	(9)		
Drops	No.	--		
Towing	No	--		
Eye Pulls	No	--		
Simulated Air Transport	No	--		
Fording	No	--		
Moisture Resistance	No	--	Yes	(11)
Temperature	No	--		
Thermal Differential	Yes	(8)		
Roof Access Tests	No	--		
Construction Tightness	Yes	(7)		
Water Tightness	No	--	Yes	(13)
Static Door Load				
Light Tightness	No	--		
Electromagnetic Interference	No	--		

TABLE 21. Cont.

- ¹ Shelter failed to meet test criteria due to a tiedown ring anchor pin pulling loose during the 4th impact test. However, failure of the pin did not result in damage which would hamper the use of the shelter.
- ² Due to the failure of the tiedown ring anchor pin, both the towing and eye pulls tests are necessary in the shelter evaluation.
- ³ Deformation of the door hinges during the 9 and 10 MPH rail hump test caused the shelter to fail the rail transport. Failure of door hinges was due to use of aluminum instead of steel hinges.
- ⁴ Failure of hinges in the rail hump test makes test evaluation of the door and its hinges necessary.
- ⁵ Shelter failure in the rail hump test was first noticed after the 9 MPH rearward direction. This impact caused permanent deformation in the shelter. Higher speed impact test (10 MPH forward direction) caused severe damage to the floor surface at the door end of the shelter.
- ⁶ Drop test should be conducted because of the severe damage to the shelter caused by the rail hump test of the rail transportation test. Severe damage to the shelter might be the result of structural weakness in the shelter.
- ⁷ Construction tightness was achieved after several leaks were found and repaired.
- ⁸ Shelter failed to pass the thermal differential test. However, with minor design modifications to the shelter, the .25 coefficient of heat transfer is obtainable.
- ⁹ Shelter failed rail transport test because of damage incurred during testing. After testing shelter was found to have permanent deformation, delamination, and sealer separation. After modification to the tiedown procedure, the shelter met the test criteria.
- ¹⁰ The reference document was a survey of damage to S-280 shelters, not a test report for S-280 shelters.
- ¹¹ Several non-stainless steel door hardware items were corroded. Other items damaged by moisture corrosion included aluminum bonding surfaces, thermal barrier material, sealer for forging surfaces, and room temperature cured adhesives.
- ¹² Approximately 15% of all post and beam shelters and 5% of all sandwich panel shelters had seal deficiencies after 5 to 10 years of service.
- ¹³ Approximately 14% of all post and beam shelters and 13% of all sandwich panel shelters experienced moisture intrusion into the shelter after 5 to 10 years of service.
- ¹⁴ No test prescribed within the S-280 specification, M11 S-55286C(EL) for fork-lift, but Reference 33 identified several damage sites from fork-lift, although the number was substantially below what was generally accepted by personnel at depot and field operations as having been incurred by fork-lift operations.

TABLE 22. DOCUMENTATION OF PROBLEM AREAS AND ADVERSE COMMENTS FOR VARIOUS TESTS PRESCRIBED BY CP 550100-E FOR THE S-530 SHELTER

Test Description	Reference No. 32	
	Problem	Comment
Mechanical and Visual Inspection		
Design Inspection		
Human Performance		
Safety		
Wall Loads		
Demonstration		
Shelter Construction Tests	Yes	(1)
Towing Eye Test		
Skid Bearing Test		
Lifting and Towing Test		
Sling Drop		
Shelter Drop Test		
Fording Test		
Sling Assembly Lift and Tiedown		
Altitude Pressure Equalization		
Simulated Helicopter Transport		
Rail Transport Impact Test		
Bounce		
Type III Mobility		
Heat Transfer		
Wind		
Dust		
Salt Fog		
Sunshine		
Solar Load		
Temperature Shock		
Humidity		
Fungus		
Rain		
Shielding		
Floor Load		
Roof Load		
Uniformly Distributed Load		
Concentrated Load		
Roof Access Stair		
Mounting Capabilities		
Door Load Tests		

¹ The cylinder drop test was failed in the test program described in the reference document.

TABLE 23. DOCUMENTATION OF PROBLEM AREAS AND ADVERSE COMMENTS FOR VARIOUS TESTS PRESCRIBED BY DES-X-1-77 FOR THE ARMY 2:1 EXPANDABLE RIGID SHELTER

Test Description	Reference Number							
	27	17	31	18				
	Problem	Comment	Problem	Comment	Problem	Comment	Problem	Comment
Intermediate Tests								
Panel Watertightness								
Insert Proof Load								
Electromagnetic Compatibility								
Moisture Resistance								
Thermal Shock								
Cylinder Impact								
Marine Atmosphere								
End Item Tests								
Structural Soundness								
Container Mode - Towing								
Dropping								
Ground Transportation - Trailer	No	--	No	--	No	--	No	--
Mobilizer	No	--	No	--	No	--	No	--
Railroad Humping								
Lifting								
Six-high Stacking								
Longitudinal Restraint								
Racking								
Lashing								
Water Leakage								
Internal Air Leakage								
Temperature								
Weight Inspection	No	--	No	--				
Shelter Mode - Electrical								
Roof Load								
Floor Load								
Static Door Load								
Water Leakage								
Heat Transfer								
Solar Load								
Blackout	Yes	(1)	No	--			No	--
Operational			No	--	No	--	No	--
Step								
Illumination								
Internal Air Leakage								
Post Test Inspection	Yes	(2)	No	--			Yes	(3)
Finish Inspection								
Operational Inspection								

TABLE 23. Cont.

-
- ¹ After the ground transportation tests, blackout curtains were not sufficient to prevent the escape of interior light when the installed fluorescent lights were in use.
- ² Shelter failed to meet a mean-cycle-between failure (MCSF) of not less than 24 movement cycles after the ground transportation test. However, the shelter did meet the mean-time to repair (MTTR) of 1-hour for organizational maintenance.
- ³ Shelter did not meet the mean-cycle-between failure. Organizational maintenance was accomplished within specified time limit, but shelter failed at mean time to repair.

Similarly, honeycomb sandwich panel shelters were also investigated and the following types of damage noted.

- Delaminated panels (32% of all shelters)
- Moisture intrusion (13% of all shelters)
- Seal deficiency (5% of all shelters)
- Rivenut deficiency (2% of all shelters)
- Forklift damage (unknown % of all shelters).

Six of the S-530 shelters were also included in the data base for the honeycomb panel shelters. All of the S-530 shelters appeared to have little or no degradation during the survey of Reference 33. These data from Reference 33 were included in Tables 21 and 22.

The largest number of comments on specific specification tests were reported in Reference 36. This document was reviewed to determine commentary on adequacy and necessity of shelter tests, particularly Section 2.2 on pp. 13-16 of Reference 36. An interesting comment by respondent 1 of Reference 36 is that a "forklift test should be included in the DES-X-1-77 shelter test program" is similar to the comments of Reference 33. (see Table 24). Three out of six S-280 shelter respondents made comments on adequacy and necessity of tests per MIL-S-55286; see Table 25. Based upon the previous field reports and prior studies, the following comments appear to be in order for the full-shelter tests (Number 11-35 in Table 17).

Test 11: Lifting and Towing Eye Strength

Both parts a and b are necessary to provide data on the strength of the eyes. The lifting and towing eyes are used repeatedly throughout the life of the shelter and are subject to repeated loads. The usual fatigue factors of safety are $(1/0.45)=2.22+$; therefore, pulls of 2.26 times the gross shelter weight are appropriate. (adequate).

Test 12: Panel Attachment Points

Both parts a and b are necessary. The test clearly is based on the S-530 test of 4.2.1.3.3.9. which calls for a minimum torque of 300 in.-lb (25 ft-lb). The 300 in.-lb requirement sounds more realistic than the 100 in.-lb (equivalent to a force of 12.5 lb acting on an 8-in. wrench). No adverse comments were made about such a test and no shelter failures were encountered relative to the mounting inserts.

TABLE 24./ DOCUMENTATION OF ADVERSE COMMENTS FOR VARIOUS TESTS PRESCRIBED
BY DES-X-1-77 FOR THE 2:1 EXPANDABLE SHELTER

Test Description	Paragraph Number	Comments of Respondent No. 1 per Reference 36
<u>Intermediate Tests</u>		
Panel Watertightness	4.4.4.1. - 4.6.1	One time qualification recommended.
Insert Proof Load	4.4.4.3. - 4.6.2.	--
Electromagnetic Compatibility	4.4.4.3. - 4.6.4.	--
Moisture Resistance	4.6.6.	Excessive in cost. Accelerated test on components better at lower cost.
Thermal Shock	4.6.7.	Conducted on panel. Single cycle should be multiple cycles.
Cylinder Impact	4.6.8.	8 samples required. Not a good test for honeycomb core panel.
Marine Atmosphere	4.6.9.	Component level testing recommended.
<u>End Item Tests</u>		
Structural Soundness	4.6.5.	--
Container Mode - Towing	4.7.1.	Test conditions not adequately specified.
Dropping	4.7.2.	--
Ground Transportation - Trailer	4.7.3.	--
Mobilizer		--
Railroad Humping	4.7.4.	--
Lifting	4.7.5.	--
Six-high Stacking	4.7.6.	--
Longitudinal Restraint	4.7.7.	--
Racking	4.7.8.	--
Lashing	4.7.9.	--
Water Leakage	4.7.10.	Should be conducted 100%.

TABLE 24. Cont.

Test Description	Paragraph Number	Comments of Respondent No. 1 per Reference 36
Internal Air Leakage	4.7.11.	--
Temperature	4.7.12.	--
Weight Inspection	4.7.13.	--
Shelter Mode - Electrical	4.8.1.	--
Roof Load	4.8.2.	--
Floor Load	4.8.3.	--
Static Door	4.8.4.	This test is being revised to include horizontal static and dynamic loads which will increase cost. Involves four doors.
Water Leakage	4.8.5.	--
Heat Transfer	4.8.6.	Good qualitative test.
(Procedure #1) Solar Load	4.8.7.	Good qualitative test.
Blackout	4.8.8.	--
Operations	4.8.9.	--
Stop	4.8.10.	Could be eliminated when standard hardware used.
Illumination	4.8.11.	--
Internal Air Leakage	4.8.12.	--
Post Test Inspection	4.9.	--
Finish Inspection		--
Operability Inspection		--

TABLE 25. DOCUMENTATION OF PROBLEM AREAS AND ADVERSE COMMENTS FOR VARIOUS TESTS PRESCRIBED BY MIL-S-95286C(EL) FOR THE S-200 SHELTER

Test Description	Paragraph Number	Comments per Reference 36; Respondent As Noted
In Process Inspection Test	4.6.1. - 4.6.7.	(Per 7) Not valid under present specifications. They believe that it would be better simulated by using the whole section of roof/side instead of a specimen 24 sq. in. (Per 8) They could do away with all environmental tests because they are using the same essential process in the specifications all the time and results have been excellent (i.e., failure/rejects). If process remains the same, results should be the same. (Per 2) Drop this test. It is picked up in 4.6.17.
Interchangeability	4.6.8.	
Riveting	4.6.9.	
Construction Tightness	4.6.10.	
Finish	4.6.11.	
Marking	4.6.12.	
Dimensional	4.6.13.	
Visual and Mechanical	4.6.14.	
Shelter Weight	4.6.15.	
Door Latch Torque	4.6.16.	
Moisture Resistance	4.6.17.	Change test from 30 days to 10 days which is sufficient time. If shelter doesn't leak in 10 days, chances are excellent it will not leak.
Temperature	4.6.18.	
Thermal Differential	4.6.19.	
Vehicular Transport	4.6.21.	
Rail Transport	4.6.22.	
Drops	4.6.23.	If shelter passes this test, it can pass any test. They believe that this test needs revision. Details of specification doesn't correlate to "real world." They said that if shelter is dropped, it is highly unlikely to hit the ground as outlined in the specification. They believe that shelter was more likely to hit on a corner.

TABLE 1251 Cont.

Test Description	Paragraph Number	Comments per Reference 36; Respondent As Noted
Towing	4.6.24.	--
Eye Pulls	4.6.25.	--
Air Transport	4.6.26.	Drop this test and use information from 4.6.25.1.
Static Door Load	4.6.27.	Drop this test.
Roof Access Steps	4.6.28.	--
Light Tightness	4.6.29.	--
Electromagnetic Interference Suppression	4.6.30.	Should be performed on 100% of shelters.
Water Tightness	4.6.31.	--
Fording	4.6.32.	--
Hold down Assembly	4.6.33.	Busting/breaking slings is dumb. This is a destructive test; 4 out of 1st 50; then 1 out of 50. The specification requires 14,000 lbs. Slings do not break until 16,000 to 18,000 lbs. applied. Why destroy good slings?

Test 13: Part Interchangeability

The JOCOTAS development test is more restrictive than the Navy shelter specifications (MIL-S-81030D) in that the JOCOTAS specification calls for a demonstration and the MIL-S-81030D calls only for measuring the hardware. The S-530 specification (CP 550100-E) also calls for demonstration of interchangeability. We conclude that this quality assurance test is both necessary and sufficient with no production test required if the materials of construction have not been changed.

Test 14: Rail Transport

Comments made previously indicate that:

- Much of the transport to date has not involved rail transport
- In the future many of the shelters will be moved by rail
- The rail transport tests may be sufficiently severe as to preclude the need for other tests.
- Many structural deficiencies of the shelters are pointed out by the rail test.

Comparing the JOCOTAS test to that in other specifications indicate that:

- A much better defined test is to be found in the S-280 specification or in the S-250 specification
- The question of air brakes set on or off arises and should be discussed prior to a final decision; allowing the impact energy to be assumed by displacement may be acceptable.

In conclusion, we feel that the test is necessary, may not be adequate, and should be better defined.

Test 15: Air Transportability

This test calls for specified G-loadings in specific axial directions relative to the shelter. Because of the military implications of air transport the test cannot be deemed anything but necessary and prior demonstration has already shown it to be adequate.

Test 16: Ground Mobility

This test is similar to the S-530 (CP 550100-E) Bounce Test (4.2.1.3.4.3. of CP 550100-E) and Type III Mobility Test (4.2.1.3.4.4. of CP 550100-E) combined.

This test is the only one in which a steady vibratory input loading is employed.

The test is deemed necessary, however, some additional specific data should be examined to see if it is adequate.

Test 17: Forklift Handling*

The gravity loads peculiar to forklift operation demand that this test which is actually a demonstration of capability, be performed. The test is deemed necessary.

There are several approaches to this test as delineated by the separate specifications. The JOCOTAS specification appears to include most of the handling requirements for forklift/shelter interfacing. The test is adequate.

Test 18: Altitude (Low Pressure) Test

The altitude test involves validation by analysis and hence should contain the worst case inflation and worse case deflation commensurate with possible and probable air transportability. No commentary on the efficacy of similar shelter tests was made by anyone in References 33 and 36 and no failures were noted of any shelters tested and described in the references reviewed. The test is both necessary and sufficient.

Test 19: Drop Tests

Commentary was made to continue to include drop tests "because of the severity of the railroad hump test." Comments were also made from depot personnel that they had personally witnessed drops of shelters during forklift operations. Specifically, corner drop tests were singled out as particularly severe (Reference 36).

The test appears to be necessary. It also appears from the S-250 specification (MIL-S-55541D) that other tests might be employed in conjunction with the drop tests to exacerbate the effect of the drops. Since we have sequentialized the tests, we feel that on the whole, the test is adequate in its current form.

Test 20: Impact Resistance

This test is applied to panel specimens and not to the shelter as a whole.

*This test only measures the ability of a forklift to engage and move a shelter without damage to the shelter; the test does not measure resistance to forklift damage which was a common complaint in the survey of References 33 and 36.

It is a quality assurance test and is very similar to other material characterization tests as specified in other specifications.

It appears to be both necessary and adequate.

Test 21: Erection and Striking Tests

This test is mandatory as a demonstration item. Both adequate and necessary.

Test 22: Tow/Dragging Simulation

This test is necessary to demonstrate fundamental deployment capabilities of the shelter. The test only demonstrates the capability of the eye in assuming loads roughly equal to those encountered in towing operations. The test does not demonstrate that the shelter can be towed.

Test 23: Drop Tests (Non-ISO Shelter with Skids)

The same comments applied to Test 19 apply to Test 23.

Test 24: Air Tightness

This test is applied to the whole shelter. Some similar testing is performed for other shelters (4.2.1.3.3.14. Altitude Pressure Equalization in CP 550100-E and 4.6.2.8. Altitude Test in MIL-S-810300), but none are as well defined as the test in the JOCOTAS Document.

Test 25: Temperature Range and Test 26: Solar Load

The JOCOTAS test No. 25 is performed as a development test at low temperature in conjunction with JOCOTAS Test No. 26, Solar Load, at high temperatures. Two tests are listed for Solar Load with the applicable one to be decided by a comparison of the two test results on a common shelter.

The test is necessary; the comparison will decide the adequacy.

Test 27: Heat Transfer

This test is similar to the thermal differential test of the S-280 specification. This test would appear to be unnecessary since:

- Test No. 26 is more severe
- Thermocouples applied in Test No. 26 could be used to establish heat transfer characteristics
- Coupled with a validation analysis for comfort, the heat transfer at the lower skin temperature can be calculated and a test is not necessary.

Therefore, we believe that the test is probably adequate, but may be unnecessary.

Test 28: Snow Load and Test 29: Roof Loads

The snow loads portion of Test No. 29 is accomplished by applying 40 lbs/sq ft over the whole of the shelter roof. This is the conventional load assumed for structures and represents very deep snow. The 660 lbs is intended to represent three individuals working in a very tight area.

The comments during the user survey (Reference 36) indicate that the case where individuals are working on the roof occurs often and regularly and, therefore, is appropriate.

Thus, the test for distributed load on the roof is necessary. It is also adequate for almost every world condition. The test for concentrated load on the roof is adequate.

If the roof were made from a homogeneous isotropic-plate instead of discrete elements, then the test for concentrated loads could be replaced by an analytical validation inferred from the results of the distributed load test. Since the shelter roof is made of discrete elements, the condition does not hold. Therefore, the test for concentrated loads on the roof is necessary.

Test 30: Door Loads

The static door hinge load test was originally designed to handle the case of a 200 lb person hanging by his hands on the top of the door and swinging on the door. It is a standard used by the various door associations. It is conceivable that in a similar loading mode, 200 lb military personnel could stand on the upper part of the door during a repair mode.

The wind gust door load test represents field conditions of somewhat exasperated but conceivable magnitude. Both tests are adequate. Since some commentary indicated that some hardware was rejected on the basis of this test, we feel that it is necessary as well.

Test 31: Floor Loads

This test is both reasonable and proper in that equipment loads of 2000 lbs over 4 sq ft are conceivable and common. In addition an overall floor loading of 65 lbs/sq ft is commonly accepted as reasonable, although high, floor loading (for sandwich panels). These two tests are adequate and necessary.

The concentrated load test is necessary, but could conceivably be inadequate. Many floor punctures were noted in the field survey commentary.

Test 32: Leveling Devices

The strength test portion of the specification is adequate and necessary. However, we recommend deployment trial runs as well.

Test 33: Blackout; Test 34: EMI Provisions;
and Test 35: Fire Resistance

All three tests are sufficient. All three tests are necessary.

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